FIRST YEAR TEACHERS TECHNOLOGY USE: PERCEPTIONS OF FACTORS AFFECTING TECHNOLOGY INTEGRATION

BY

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ABSTRACT

For decades, technology integration into the classroom and curriculum has been at the forefront of education. Although public perception and technology funding assumes that teachers are integrating technology into the curriculum, research shows that actual integration is still far from being fully implemented. This study detailed how first-year teachers deal with technology integration from a concerns-based approach. The study was designed to help post-secondary institutions understand the concerns of first year teachers with regard to their preparatory steps regarding technology use in the curriculum. Secondarily, it was a means to explore different external factors that support teachers in the field and technology integration. The study was grounded by the Concerns-Based Adoption Model (CBAM), first proposed by Hall, Wallace, and Dossett in 1973. CBAM, a widely used framework, allows researchers to assess responses to various innovations in three different ways: (a) concerns about innovation, (b) levels of use of the innovation, and (c) quality of implementation of the innovation. Implementing the first measurement strategy to understand overall teacher concerns, CBAM profiles were generated for 22 first-year teachers. These profiles represented a range of first-year teacher concerns and formed a selection of a sample group, based on the top three concern groups, who were randomly interviewed and data were triangulated and used to clarify CBAM findings. To guide this study, two questions were investigated: (a) What are first-year teachers' concerns towards the use of technology in their classrooms to achieve higher-level learning as shown by their score on the Stages of Concern Questionnaire (SoCQ)? and (b). What do first-year teachers express as their concerns with technology use? Overall group data, as well as individual interviews, indicated that the greatest concern of the majority of the first-year teachers participating in this study lay within

Stages One and Two, which are defined as the stages in which self-concern is great and little thought is spent on others or the use of technology. This paralleled teacher development theories that first-year teachers are in a state of no concern or most concerned about themselves as the teacher. Thus, they are less concerned about the student and the curriculum. Both quantitative and qualitative evidence explained that first-year teachers have varying concerns about technology use in the classroom, and there is a call for external support mechanisms to assist them with integrating technology into the curriculum.

DEDICATION

This work is dedicated to Paul Weston Jones who taught me the value of hard work, dedication, sacrifice, and accomplishment. He is an extraordinary husband for whom I have the utmost respect. He provided unending support and love in our home to insure the completion of this document. I love you and I am eternally grateful.

To my children, who have sacrificed a great deal so that I might accomplish this achievement while they are still young. It is my hope that I have set an outstanding example of perseverance and hard work so that they may carry this example forward and reach beyond their wildest dreams. Madison and Avery, you are both gifted with endless passion, kindness, personality and truly unique special gifts. I love you both so much.

In memory of my grandmother, E. Jane Tipton, who continually modeled perseverance, hard work, and dedication under the harshest circumstances. Her passing helped to advance the completion of this feat and I am forever grateful for her example, as well as her unbelievably big spirit. We are forever blessed to have known and loved our spunky "Mamma Jane!"

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RESEARCH PROBLEM

Introduction

The use of technology with regard to learning is not a new innovation. Technology has become a staple for every facet of life, from business to manufacturing to the classroom. It is society's perception that students and teachers have become dependent on technology to perform everyday functions in the classroom for the purposes of learning, instruction, and living. A survey by the National School Board Association (2005) showed that teachers believe technology in the classroom can help to improve students' critical thinking and produces better communicators. Educators believe the value and importance of technology in the classroom contributes to the belief in building "lifelong skills such as problem solving, creative thinking, and self-directed learning" (Kirkwood & Foster, 1999). Teachers currently use technology in the classroom to perform operations ranging from basic, such as taking a lunch count, to applications that are more complex, such as integrating web page design and multimedia projects, to supporting curriculum standards. Regardless of the task, the integration of technology in the classroom requires teachers to acquire technical skills, integrate those skills into the curriculum, and, ultimately, contribute to student learning while meeting current curriculum standards.

The National Education Technology Standards for Teachers (NETS-T), the International Society for Technology in Education (ISTE), and state-based standards emphasize the importance of technological integration within the education process in order to gain teacher licensure and school accreditation. However, with the influx of technology standards and varying technology budgets, many schools are dealing with a new problem. Districts have allocated budgets towards

K-12 technology, as well as continuing education to integrate the technology, but technology is underutilized within the classroom with regard to instruction (Ertmer & Ottenbreit-Leftwich, 2010). If technology is seen as a positive attribute to student learning and a teacher's day-to-day operations, then why aren't more teachers utilizing technology? What contextual factors are affecting the integration of technology to improve student learning?

It is undeniable that teachers need to be competent regarding both technical skills and technology integration to impact student learning in today's schools (Ward, West, & Isaak, 2002; Brogden & Couros, 2007; ISTE, 2007). According to a 2003 U.S. Department of Education (U.S. DOE) survey, "technology is now considered by most educators and parents to be an integral part of providing a high-quality education" (U.S. DOE, 2003, p. 3). To facilitate the use and integration of technology within K-12 institutions, state and federal laws have been adopted to attempt the improvement of instruction through various aspects, such as preservice teacher education and continuing education for in-service teachers. Currently, the NETS-T have been adopted or adapted by 49 of 51 states (ISTE, 2007). After decades of federal and state legislation and training for technology integration, coupled with generous budgets for technology and Internet connections, studies show that teachers still do not feel comfortable with technology in the classroom and do not integrate it as much as once thought (Barack, 2005; Sandholtz & Rielly, 2004). The National Center for Education Statistics reported in 2010 that nearly all classrooms in the United States have at least one computer with Internet access; however, only 40% of teachers surveyed indicated that they frequently use computers in their instruction (U.S. Department of Education, 2010; Gray, Thomas, & Lewis, 2010). Most important, the access to technology has not drastically changed the way in which teachers teach even with high-stakes testing, an

abundance of technology dollars, and national and state standards (Cuban, 1993). In most classroom situations, teachers use their computers mainly for tasks involving preparation and administration, as opposed to integrating the technology into the curriculum for student learning (Franklin & Molebash, 2007). It is interesting to note that even first-year teachers, who are thought to be more tech savvy, are not major proponents of technology use in the classroom (Kirschner & Selinger, 2003; McKinney, M., Jones, W., Strudler, N., & Quinn, L., 1999).

As first-year teachers complete student teaching and gain licensure, they are ready to enter the classroom with a new set of tools and approaches. Traditionally, Schools of Education adhere to standards that regulate what teachers need to know to become licensed educators with regard to their content knowledge and pedagogical approaches, coupled with classroom management, technology, and organizational skills. Within teaching standards, several competencies fall under the term "technology." Some of these standards focus on the importance of technological skills, while others focus on integration of technology into the curriculum. There is a disconnect between what preservice teachers are taught in Schools of Education and what actually occurs in their first classroom teaching assignment with regard to the integration of technology (Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010; Ward et al., 2002;). The largest percentage of Schools of Education offer minimal technology courses and do not adequately meet teacher needs regarding technological pedagogy and integration techniques for educators as they begin teaching (Kirkwood, 2000; Sang, Valcke, van Braak,, & Tondeur, 2010). A large percent of postsecondary institutions have a "one-technology-course curriculum," where preservice teacher courses stress computer literacy encompassing email basics and word processing applications (Brzycki & Dudt, 2005). The Milken Exchange on Teacher Technology maintains that integrating technology into

all preservice teacher courses improves proficiency (Moursund & Bielefeldt, 1999). This conclusion would lead one to believe that preservice teacher training with technology might affect technology use in the classroom; however, according to Tabachnik and Zeichner (1984), teacher education has little or no influence on first-year teachers. This mean there is evidence that teacher education possibly influences teachers later in their career, but more importantly, there are other outside or contextual factors contributing to first-year teachers' classroom experience and their use of technology (Ertmer, 2005).

Problem Statement

Technology is present in many facets of the world, including the field of education. Research, as well as national and state legislation, stressed the importance of a teacher's ability to use technology for day-to-day operations, as well as integration into the curriculum to increase student learning. However, research also suggested that first-year teachers go through profound phases of development and face a variety of challenges, as they adjust to their new environment, which could possibly interfere with their use of technology. Various levels of growth exist between the preservice teacher and the novice teacher in the classroom. When coupled with contextual factors, such as pressure for technology integration, school culture, student teaching experiences, and lack of technology support or resources, the role of technology in schools has become undefined (Feiman-Nemser, 2003). As preservice teachers progress through their undergraduate education, they may have learned about technology for general and organizational tasks (e.g., administrative use) or for curriculum integration within their content area. Nevertheless, they do not seem adequately prepared for the outside, or contextual, factors that will influence their first teaching experience regarding the use of technology (Bullough, 1989;

Grossman, 1990; Zeickner, Tabachnick, & Densmore, 1987). Simply stated, the acquisition of knowledge regarding technology does not necessarily translate into effective technology integration or use (Polly, Mims, Shepherd, & Inan, 2010).

In an effort to understand these contributing contextual factors better, this descriptive research study, using the Concerns Based Adoption Model (CBAM), focused on first-year teachers' use of technology at the elementary and secondary level and the role contextual factors play in their use of technology. CBAM encompasses the concerns of the individual teachers and administrators while they also experience change regarding a new innovation within their school (Hall & Hord, 1987; Hord, Rutherford, Huling-Austin, & Hall, 1987; Loucks-Horsley & Stiegelbauer, 1991). CBAM is comprised of three independent tools. The first of these tools is the Stages of Concern Questionnaire (SoCQ), which was employed in this study. The implications of this study served to clarify how first-year teachers integrate technology, shedding light on outside factors that may influence their success, challenges, and frustrations with technology in the classroom. This study also highlighted the ways in which technology is being used in the classroom, effects of use or nonuse, and changes the first-teachers experience concerning technology. The outcome will assist universities with curriculum planning for preservice teachers, and impart insight into the support and environment most suited for beginning teachers provided by school districts, support staff, administrators, and veteran teachers in better integrating technology and teaching.

Specifically, the study addressed the following questions:

RQ1. What are first-year teachers' concerns about the use of technology in their classrooms to achieve higher-level learning as shown by their score on the SoCQ?

RQ2. What do first-year teachers express as their concerns about technology use?

Summary

The use of technology in schools is an evitable tool in a first-year teacher's repertoire. However, the availability, integration, and use of those specific technologies that are readily available for each teacher are different depending on a variety of factors. Although there is great encouragement from the U.S. government, as well as from individual states and school systems, for technology to be used widely within the curriculum, not all teachers take advantage of using it for student learning (Ertmer & Ottenbreit-Leftwich, 2010). While millions of dollars have been spent to place technology in classrooms, considerably less attention has been paid to helping teachers make the transition into a technology-rich learning environment which may, in turn, influence student learning (National Center for Education Statistics, 1999). Ertmer (1999) argued that various internal and external factors may be contributing to the use or nonuse of technology in their classrooms. This study examined the concerns that first-year teachers had with regard to use of technology in their schools in terms of general classroom use, as well as integration into the curriculum.

Theoretical Framework

Due to varying internal and external factors that affect teachers' implementation of technology, it is important to examine first-year teachers from a concerns perspective. Concerns, although constantly changing, are one way to understand how teachers feel about their environment and possible use of new innovations within their schools. The study explored concerns with regard to teachers and technology use in order to provide more insight for teachers, administrators, and teacher educators.

Concerns Based Adoption Model

Various tools have been developed to assess teacher's developmental stages. This study employed CBAM to assess first-year teachers' technology use. The CBAM model for implementing and evaluating the adoption of any innovation in education was first published in the mid-1970s and has undergone further validation for over 30 years. The CBAM model is comprised of three parts: Stages of Concern, Levels of Use, and Innovation Configuration (Hall, Wallace, & Dossett, 1973). Stages of Concern (SoC) deals with expressed adopter concerns and issues related to his or her experience with, or perception of, the innovation. The purpose of this part (i.e., SoC) is to analyze user feelings, observations, problems, successes, and failures while progressing through the change process of innovation adoption. As a general model of concern, SoC has seven categorical levels, which place the participant based on his or her concern toward a specific innovation (e.g., new technology). The CBAM tool uses not only quantitative analysis, but also qualitative analysis through interviews and observations primarily implemented in Levels of Use (LoU).

Initial studies regarding CBAM indicated that first-year teachers are primarily concerned about class control, their own content knowledge, teaching situations, and evaluations by their supervisors (Fuller, 1969). Studies also showed that teachers have different concerns based on their years of experience (Gabriel, 1957). Although all teachers share concerns in general, they differ with regard to student learning, themselves as educators, their ability to teach, and making an impact on student learning. The CBAM addresses each one of these assumptions: the individual's concerns about the innovation, the particular manner in which the innovation is delivered or implemented, and the adaptation of the innovation to the individual.

Together, the research of Fuller (1969) and Fuller and Brown (1975), as well as other scholars (Cruickshank, 1981; Thompson, 1963), led to several important findings regarding teacher problems and satisfaction. From these studies, consistent findings have emerged. According to Fuller (1969), to summarize the data as it is reported by these investigators, what is known is that beginning teachers are concerned about: class control; their own adequacy; the situation in which they teach; and evaluations by their supervisors, by their pupils, and of pupils by themselves (p. 210).

Several studies also showed that there are distinct patterns regarding teachers' problems and satisfactions. It should also be noted that these issues differ greatly depending on years of teaching experience.

Clearly, experienced teachers have their own group of problems and satisfactions, basically what Fuller (1969) called "concerns." Through the discussion of teacher development and concerns, Fuller's phases of concern were later developed in clusters of concern (Hall & Hord, 1987). The clusters of concern are associated with teachers and their teaching careers and those concerns in general that changed in a predictable pattern as teachers become more experienced and sophisticated in the job role (Fuller, Brown & Peck, 1967). Each cluster has its own content and dynamic. Those clusters are: Unrelated Concerns, Self Concerns, Task Concerns and Impact Concerns.

Unrelated concerns are generally those concerns that have little to do with teaching or student impact. The majority of these concerns can tend to focus on preservice teachers as they deal with life's happenings, but rarely on their role as future teachers. For example, they might

think about what their social life will entail in the weeks to come, but there is little concern or thought for the role as a teacher at this point.

Self-concerns are those concerns that emerge while preservice teachers have their first experiences in the classroom, as well as student-teaching experiences. An egocentric mindset forces them to hone in on self-doubt about content knowledge, inadequacy, and facing uncertain situations. Typically, their reflections would center on their ability to teach and control students.

As preservice teachers become more immersed and involved in the school environments and their experiences and encounters increase, their concerns are task related. They become more focused on preparing materials, coordination, scheduling and logistics (Hall & Hord, 1987). At this point, their concerns focus around how busy they have become and feelings of being overwhelmed. Ultimately, teachers' concerns focus on the impact they will have on the students and their development, as well as their own impact and improvement as a teacher. Effective ways of teaching, increased interest in student learning, engaging all learners, and adapting different ideas or knowledge into regular lessons are the focus of this stage.

Although most of Fuller's work regarding concerns stems from the field of education and her theory is a cornerstone for teachers, administrators, and teacher-educators, it can be applied in many contexts. Concerns are a phenomenon that occurs within all of people when faced with new experiences, demands to improve, and changes in environment. Hall and Hord (1987) stated that Fuller's cluster of concern could be related to any new innovation and the change process that occurs within environments. Generally, the definition of concern becomes a concern itself, as some see it is indefinable and readily interpretable using one's own frame of reference. As Hall, George, and Rutherford (1977) defined concern, "the composite representation of the feelings,

preoccupations, thought and consideration given to a particular issue or task is called concern (p.5)."

Most important, Stages of Concern research proposes that concerns change over time, and the idea of scales or stages of concern is generally accepted, but is not locked into a one-way progression (George, Hall & Stiegelbauer, 2006, p. 9). Hall and Hord (1987) stated that there is a quasidevelopmental pattern to changes in concern that might not follow the theoretical progression for any reason, including the attempted adoption of an inappropriate innovation. This means that, due to current educational trends or pressure from outside sources, a school might attempt to implement a new innovation that is inappropriate for its teachers and/or students. To assess the adoption of a new innovation (i.e., technology), a tool was developed to categorize concern and create profiles of concern for the individual.

Hall, Wallace and Dossett (1973) at the University of Texas–Austin sought to extend Fuller's work on levels of concern. The CBAM, developed in the late 1960s (Hall & Hord, 1987), is primarily focused on the concept and development of concerns within the field of education. The CBAM includes seven stages of concern: (a) Awareness, (b) Information, (c) Personal, (d) Management, (e) Consequence, (f) Collaboration, and (g) Refocusing. The CBAM is a commonly used model that describes how people, particularly anyone facing change, deal with the concerns while facing change within their profession. Hall, Wallace and Dossett (1973) included further research and development regarding quantitative data reflecting the (SoCQ) that change brings with it and how that affects people as they learn about an innovation and the stages of that process. Hall and Hord propose the use of three distinct tools that can be used to further describe, explain and predict teacher's behavior during the change process.

After over 30 years of in-depth research, Hall and Hord (1987), based on the CBAM model from the changes that educational personnel, namely administrators and teachers, are experiencing. Marcinkiewicz (1994) argued for the use of concerns-based models in education technology research because to "understand how to achieve integration, we need to study teachers and what makes them use computers, and we need to study computers and what makes them want to, or need to use them" (p. 234). After many years of in-depth research surrounding the definition, habits, and behaviors surrounding change, Hall & Hord (1987) suggested there are three components regarding the process of change. Three main ideas support the ideology that change facilitators, in this case a mentor teacher or supplemental education (e.g. in-service), can assist others in using technology within the classroom. The facilitator's role is to use formal and systematic ways to probe individuals and groups to understand them and the way they react to the change. These ideas regarding change stand on a platform of thought that concerns of the individual are critical for implementation of a new innovation or idea(s) for the classroom (George, Hall, & Stiegelbauer, 2006).

Through past research, three dimensions are identified as: (a) Stages of Concern (SoC), (b) Levels of Use (LoU) and (c) Innovation Configurations (IC). According to Hall & Hord (1987), with the use of three diagnostic tools the facilitator can then use a timeline to provide interventions or "actions that affect and facilitate teachers use of new programs or practices" (p. 13) within their classrooms. In this case, when the tools are employed, it could help to assist teachers, as well as other stakeholders, pinpoint concerns and aid the change process as teachers adjust to technology within their classroom.

The SoCQ portion of the tool uses 35 questions to establish how teachers perceive and feel about the particular innovation. In this study, CBAM was used to establish the general feelings and perceptions that first-year teachers have about using technology in the classroom. CBAM was one of the first tools that considered the change process for teachers from the standpoint of concerns (Anderson, 1997). The instrument used is a questionnaire with a set of scales to prepare a numerical and graphical representation of the type and strengths of each participant's concerns based on the focus of the researcher.

The SoCQ encompasses a portion of CBAM to determine the concerns of people (e.g., first-year teachers) who were undergoing change. In this study, the adoption of a new role, such as integrating technology during the first year of teaching, was treated as a "change" to the participants' professional practice.

The LoU portion of CBAM identifies what the teachers are doing, or are not doing, in relation to the "innovation," which, in this case, was the use of technology in the classroom. It is the sequence that users pass through as they gain confidence and skill in using the technology. The sequence ranges from nonuse to high levels of use to, eventually, institutionalization. The LoU uses a structured interview and observation methodology to obtain the data needed to place participants at one of the levels.

The IC dimension is the third tool that makes up CBAM. This tool, although addressed, will not be implemented because it is viewed as a diagnostic tool in nature and scope. The researcher did not consider the nature of the actual technology (innovation) being used, but rather the insight and concerns of the implementer (e.g., first-year teachers). It would also be difficult to determine the actual innovation due to the varying amounts of technology available to teachers.

The SoC and LoU were first developed by Fuller (1969), and then IC was developed later through continued research by of others (Hall, George & Rutherford, 1979; Hall, Loucks, Rutherford & Newlove, 1975).

Qualitative research in the social sciences has used writing, or journaling, as a method of inquiry. After the SoCQ was administered and analyzed, a semistructured interview with purposefully chosen participants was triangulated for greater, richer insight into possible successes and failures with technology use within the classroom (Denzin, 1978). This technique was used as a guide to categorize reoccurring themes and assist in understanding first-year teachers' experience with technology. The literature indicated there are various internal and external factors (e.g., personal development, access, support, time, etc.) that could potentially make a difference in those experiences (Ertmer, 1999). In this study, those individual-based factors helped produce recommendations for school districts, training regarding preservice technology education, as well as support and education for teachers in the classroom. Therefore, it is pertinent that multiple stakeholders within education reflect on the current curriculum and the application of technology within the career of teachers, specifically first-year teachers.

CHAPTER TWO

REVIEW OF LITERATURE

A literature review was conducted with regard to technology and teaching. Recurrent themes were identified and used concerning preservice teachers' and current teachers' use of technology, as well as internal and external factors that affect technology use. Although this study investigated only first-year teachers, it was important to identify all themes regarding teaching and technology use in general. Three major attributes within the literature were identified and used in the review: (a) teacher's and technology, (b) the concerns of first-year teachers, and (c) external and internal factors that affect first-year teachers.

Teachers and Technology

Although there are various standards that guide the implementation and use of technology within teacher preparation and the teaching field, first-year teachers have been subject to the NETS-T, as well as their state-based standards, to gain licensure. The International Society for Technology in Education's NETS for Teachers Project and the U.S. Department of Education "facilitates a series of activities and events resulting in a national consensus on what teachers should know about and be able to do with technology" (ISTE, 2007). Therefore, the ISTE has set forth both specific conditions for teachers to fulfill and various career marks. For a first-year teacher, these conditions include: (a) professional development, (b) access to technology, (c) technical assistance, and (d) integration into the curriculum. While there have been initiatives to increase teachers' use of technology with such guidelines or conditions, there are still questions surrounding the personal context, school support and preservice education of first-year teachers and their ability to successfully integrate technology (Albion & Ertmer, 2002; Koch et al., 2012).

The NETS-T are focused on preservice teacher education; defining fundamental concepts; and knowledge, skills, and attitudes for applying technology in educational settings. Theoretically, all preservice teachers should meet these standards, which are set annually through cooperation among universities, professionals, and teachers. There are six standards areas that focus on (a) operations and concepts; (b) planning and design of learning; (c) teaching, learning and the curriculum; (d) assessment and evaluation; (e) productivity and professional practice; and (f) social, ethical, human and legal issues (ISTE, 2007).

The NETS-T performance profiles are subdivided into four areas regarding years of experience within the teaching field. The four levels focus on (a) General Preparation, (b) Professional Preparation, (c) Student Teaching/Internship, and (d) First-Year Teaching. The standards for first-year teachers are for those teachers who have completed student teaching and are under contract with a school district. It should be noted that NETS specifies the importance of mentoring relations within the school, as well as specific competencies. Those competencies to be met fall under the before-mentioned six major categories and encompass 21 competencies (ISTE, 2007).

State standards for teachers are valuable when first-year teachers gain licensure and start teaching as professional educators. Because this study was conducted using teachers from the state of Kansas, the professional education standards, based on those standards developed by member states of the Interstate New Teacher Assessment and Support Consortium (INTASC), were used. Kansas has adopted and made adaptations to the INTASC standards; adding standards concerning the integration of curriculum, history and philosophy of education, and technology

(KSDE, 2005). In general, schools, colleges, and departments of education use the professional education standards to guide their curriculum to accompany all the endorsement areas.

Of the now 13 Kansas INTASC standards, one of the standards focuses upon the importance of technology knowledge and integration into the teaching field. Each standard is broken down into areas of knowledge and performance indicators, but, more specifically, they encompass guidelines and examples for teachers to follow regarding the specific standards. The following Kansas state teaching standard regarding technology states:

Standard #12: The educator understands the role of technology in society and demonstrates skills using instructional tools and technology to gather, analyze, and present information, enhance instructional practices, facilitate professional productivity and communication, and help all students use instructional technology effectively. (KSDE, 2013)

Knowledge

The educator understands different kinds of technologies available to society and the roles these technologies play.

The educator has knowledge of the uses of a variety of media communication tools and techniques to enrich learning opportunities.

The educator understands how technology and other instructional tools can be used to enhance instructional practices, enhance professional development, and facilitate professional productivity.

The educator understands the sociological, ethical, and economic issues related to technology use.

The educator understands the role of technology in gathering, analyzing, and presenting information and managing educational change.

Performance

The educator utilizes a variety of appropriate instructional technology and tools to prepare and deliver instruction.

The educator plans and teaches lessons in which all students apply technology and other instructional tools and resources appropriately and effectively.

The educator uses appropriate technology to gather, analyze, and present information, enhance professional development and learning, and facilitate professional productivity (KSDE, 2005).

Standards for teachers, whether first-year teachers or veterans, can be based on these guidelines for what is to be conducted regarding operations in the classroom on a macro scale; however, these guidelines do not steer the everyday practitioner, especially those first-year teachers who are trying to adjust to a new career.

First-Year Teachers

Traditionally, new teachers experience stages of development that range from survival, discovery, and adaptation and learning (Feiman-Nemser, 1983). During the first year of teaching, and perhaps longer depending on the individual, teachers make decisions about the classroom, curriculum, and classroom management based upon trial and error. Various researchers have cited teachers' progress through various stages of development (Berliner, 1988; Fuller, 1969; Kagen, 1992; Katz, 1972), as well as the importance of mentoring for new teachers entering the field (Feiman-Nemser, 2003). Additionally, the value of in-service content and focus centered on a

teacher's years of experience and teacher development phases effect teacher outcomes and success. (Fuller, 1973; Fuller & Brown, 1975; Hall & Hord, 1987). The first few years can be a fight-or-flight response, and many teachers state they had little time for technology because they were centered on classroom management, pedagogy, and curriculum content (Novak & Knowles, 1991). The stages of development for teachers are not defined by age, but by the teachers' cognition and adaptations to their current teaching environment. Katz (1972) described development in preschool teachers as a stage of survival, consolidation, renewal, and maturity. Fuller (1969) argued that the preoccupations of beginning teachers follow a developmental pattern that starts with concerns about self, progress toward concerns about teaching, and finally arrival at concerns about pupils. Although teaching phases may assist in shedding light on the situation, it is also known that teachers struggle their first few years in the field, and attrition rates have increased due to the lack of mentoring, administrative support and continuing education by the teachers' educational institutions (Darling-Hammond, 2003).

Contrary to popular belief, preservice and beginning teachers do not use computers more than their more experienced colleagues (Hadley & Sheingold, 1993; NCES, 1999). Although beginning teachers report wanting to integrate computers and possess adequate technical skills, they typically lack knowledge about how to integrate computers within the more routine tasks of teaching and managing their classrooms (Ertmer, 1999; Novak & Knowles, 1991). Novice teachers become overwhelmed with the day-to-day tasks of teaching and tend to concentrate on themselves as teachers while technology integration is set aside and viewed as not essential in the classroom (Kagen, 1992).

The current economic condition in the United States is one area of concern that also affected this study due to the lack of, or fluctuation in, funding that directly affects first-year teacher employment. Although there is not a great deal of formal research with regard to this matter, it is undeniable that state economies have been affected by governmental funding over the last decade. In April 2009, all states experienced up to 50% budget cuts, which directly affected the hiring of new teachers (Whitehouse, 2012). Consequently, states like Ohio eliminated more than 540 teaching jobs in the fall of 2009 (Cohen & Walsh, 2010). With regard to Kansas, an allocation of funds for hiring new teachers was reallocated to other state-based agencies, a majority of which were Medicare-based expenses as reported in 2012 by the Obama Administration (White House, 2012). In 2007, the State of Kansas cut funding by 13% and, recently, Kansas funding has been deemed unconstitutional (Wichita Eagle, 2013). Regardless of the debates, there is no denying that funding is an issue. In Texas, state funding has been cut drastically, while those graduating from teaching programs only increase. The lack of hiring in the state of Texas is forcing recent graduates to relocate or change their career paths.

With the lack of funding in many school districts, superintendents and Boards of Education have been forced to refrain from hiring new teachers. Districts were largely forced to fill vacancies from within the district to minimize costs. In some cases, districts refrained from filling vacancies, but covered the need by increasing classroom size. In combination with funding, general shortages in education have been experienced over the last decade. A majority of the problem stems from the increase in teacher attrition. For example, 25% of beginning teachers in the United States leave teaching before their third year, and almost 40% leave the profession within the first five years (Chang, 2009). Therefore, a combination of budget cuts and attrition has

likely decreased the number of first-year teachers who were able and willing to participate in this study.

Teaching Context or Internal and External Factors/Environment

Ryan (1986) suggested that teachers' transitions through various stages of development during their career can be divided among four loose, but distinguishable, professional growth stages that include: (a) fantasy, (b) survival, (c) mastery and (d) impact. During the first years of teaching, the fantasy and survival stages are the foreground through which the act of teaching becomes a serious reality check for those in the field. Struggles during the first years of teaching usually destroy the fantasy of being a teacher and focus on maintaining control and order in the classroom through discipline (Bullough, Knowles, & Crow, 1991). While the reflective struggle is evident to most first-year teachers, it is common for others, including first-year teachers, to dismiss issues or hardships due to lack of training or skills. However, issues of teacher socialization and development need to be considered in regard to "interactions of the teachers in *context* and in relation to the meaning associated with this interaction" (Bullough et al., 1991). As with any professional, first-year teachers must learn their job while actually teaching. This means teachers must demonstrate a set of competencies that they are merely learning and have not yet acquired, educating themselves through self-discovery (Schon, 1987).

Bullough et al. (1991) asserted that the specific school context within which each teacher practices can either help or hinder the resolution of teaching issues or problems. Some teaching contexts can increase teachers' vulnerability and ability to teach, whereas other contexts can help to boost the new teachers' self-esteem and understanding of the job role. Contextual issues, high-stakes testing, and content knowledge can be common factors that influence new teachers'

instructional abilities. With regard to technology integration, contextual issues could be affected by support from a mentor or administrator, self-knowledge and confidence, resources, or merely students' willingness to learn something new.

Simply stated, regardless of the teacher and the individual differences in each school environment, when it comes to the integration of technology into the classroom, there are varying factors for every new teacher that affect use. Zhao, Pugh, & Sheldon (2002) stated that characteristics of the technology itself and contextual factors largely out of the control of a first-year teacher can play crucial roles in technology integration decisions and classroom practices.

Technology Context

There are various contextual factors within teaching that affect the use of technology in the classroom. Kirkwood (2000) stated that elementary teachers face difficulties integrating technology due in part to the lack of general materials, commercial kits to assist with integration, the need for workspace, and more time for training or in-service. In general, teachers are more worried about the actual technological application than the work space or software needed to carry out integration tasks. This might lead some to believe that teachers feel that technology is more than just computers and software applications, and that technology encompasses problem solving and solutions; ultimately building skills that lead to fun and exciting experiences (Kirkwood, 2000).

The lack of parent involvement and administrative support combined with poor student-teaching experience and lack of technical equipment were cited as problems from the last decade. However, those problems, coupled with the advent of greater standardization, curriculum

competencies, and lack of funding have presented potential new problems within education (Studler & Wetzel 1999). Strudler, Falba, and Hearrington (2001) reported more concrete contextual factors that affect technology use among first-year or beginning teachers. Those teachers that participated in their study reported issues regarding: (a) access to computer resources; (b) support for technology; (c) preparation to teach with technology lagging behind preparation in regard to general instructional strategies; and (d) student teaching having a minimal impact on preparation to teach with computers (Strudler, Falba, & Hearrington, 2001). Findings of the study are consistent with the mounting evidence that beginning teachers are not adequately prepared to teach with technology, but are also limited by time and resources (Smerdon et al., 2000).

On a more intimate scale, Clausen (2007) reported on two first-year teachers who reportedly felt overwhelmed and had little time for integrating technology into their classroom. Factors such as lack of support in the classroom and access to technology contributed to the dilemma of technology integration into their classrooms. Resolutions such as shared planning time and relationship building with veteran teachers or a technology coordinator, all forms of mentoring, helped to ease discomforts of the teachers' technology integration and preparedness (Clausen, 2007).

Mentoring

There are many theories that posit why teachers are successful or what attributes to teacher attrition, but one of the most cited factors is mentoring (Feiman-Nemser, 2003). Researchers Moursund and Bielefeldt (1999) found that there is very little connection between formal preservice education and the ability to ingrate technology into one's teaching. After examining the literature on mentoring, Jacobi (1991) concluded that mentoring, a "one-to-one helping

relationship and nurturing process between a mentor and protégé" (p. 513), provided social support that buffered the stress associated with teaching demands. Jacobi also identified three functions of mentoring that helped reduce stress: (a) direct assistance or professional development, (b) emotional support, and (c) role modeling. Role modeling, although beneficial at all levels, was most effective for those with concerns for others within the Impact Level.

Feiman-Nemser (2003) cited the importance of teaching first-year teachers the ropes and providing them a safe environment for learning to become teachers and not just assuming that their teacher education has prepared them for all the contextual factors (personal development, instruction, assessment, school culture, classroom management, support, and access to technology, etc.) they will face. The basis of a quality induction program should encompass mentoring. Mentoring should not be seen as a role, but as an obligation regarding teaching; not just a collegial friendship, but true support with curriculum and the classroom. Mentor training and induction programs are incorporated in schools with first-year teachers; however, it is often something schools boast about, but actually do very little regarding follow-up and mentor training. Without proper training and accountability, mentoring roles become ineffective and first-year teachers are left to sink or swim (Johnson & Birkeland, 2003). Smith and Ingersoll (2004) found evidence to indicate that beginning teachers who participated in induction and mentoring activities in their first year of teaching were less likely to leave the teaching profession.

The role of mentors or induction programs is built on the premise that veteran teachers should make teaching visible, including explanations of their thinking, and provide a breakdown of approaches to beginning teachers (Feiman-Nemser, 2003). The use of mentoring in schools can help to provide the support and confidence that first-year teachers need when facing a new career

and new surroundings. It can also help increase teacher retention (Ingersoll & Kralik, 2004). Mentoring by veteran teachers can range from helping first-year teachers with support, socialization, and adjustment to the rigors of teaching, to demonstrating their teaching repertoire. The role of mentoring by cooperating teachers, college professors, and veteran teachers affects how first-year teachers view their job, approach curriculum, conduct their classes, and, quite possibly, whether or not they integrate technology into their curriculum (Dexter & Riedel, 2003; Firek, 2003).

Access

Although government and state bodies constantly discuss the importance of technology in the classroom, there is little time for teachers to access the technology (Clausen, 2007). Typically several in-services per year are aimed at making teachers aware of new technologies and the benefits of the technology regarding student achievement and integration into the curriculum. However, little time is devoted to follow-up sessions, play time, or brainstorming for incorporation into the teachers' current curriculum or simply making the teachers comfortable enough with the technology to incorporate it into teachings (Jones, 2001). Teachers are left with new and exciting ideas; however, they soon fall back into routine teaching methods due to the lack of support and follow-up.

There is often discourse among preservice teachers when they leave the university and enter the classroom about technological equipment that is different or simply absent from what they know or learned. This change in technology and support can ultimately affect first-year teachers' use of technology in the classroom. According to a report released by the U.S. Department of Education, National Center for Education Statistics (Smerdon et al., 2000), 78% of

teachers surveyed felt the lack of computers was a barrier to their use of technology. This study also found that teachers who perceived the lack of computers and time for students to use them as barriers were less likely than other teachers to assign students to use computers or the Internet for instructional activities. Frustrations can build as preservice teachers become accustomed to a level of technology use in their undergraduate education, only to discover that the school or cooperating teachers have different access or expectations regarding technology integration or use (Handler, 1993).

Support

The student-teaching experience is the practical springboard from which preservice teachers can leap into molding the pedagogy and methodologies together and apply what they have learned in their first teaching experience. However, there is inadequate support in the classroom from cooperating teachers or mentors, where little emphasis is placed on the incorporation of technology for problem solving, team building, and higher-order thinking or a Constructivist-based classroom. Mounting evidence shows cycles of poor technology integration that begins at the preservice level where methods teachers (professors) and cooperative teachers can be the key to technology integration (Handler, 1993). However, more and more research points to the lack of modeling technology integration into their curriculum at the preservice level, therefore setting the tone for technology in the classroom (Ertmer & Ottenbreit-Leftwich, 2010). If adequate attention and support is not given to developing teachers, then the use of technology for higher-order thinking and a student-centered classroom will become pointless, and eventually obsolete. In a world where students are tech savvy beyond any other generation, this scenario puts education at a disadvantage.

It is possible that support for first-year teachers can be presented in a formal mentoring or induction program coupled with a supportive administration. The lack of support, for example, from teaching cadres and administrative personnel can be one of the greatest factors leading to attrition among new teachers (Association for Supervision and Curriculum Development, 2004). Lack of support also carries over into the classroom regarding technology. When administrators support teachers with funding, training, and support, as well as goals regarding technology use in the classroom, the integration of technology into the curriculum is more likely (Pickens, 2001).

Although there is a great deal of research regarding assisting preservice educators and stakeholders to understand ties between teachers and their need for technological support; there is a lack of key research regarding first-year teachers and technology integration. This study was designed to provide greater insight into those key needs and should contribute to the basis of knowledge regarding first-year teachers and technology use.

Summary

A review of the literature and research revealed that both the National Education Technology Standards and the U.S. Department of Education expects new teachers to integrate technology in teaching; however, data show that very few first-year teachers are equipped to do so. Teachers move through various developmental stages that initially encompass a more egocentric approach to teaching and move through a more holistic, student-oriented approach as their experiential level changes. While new teachers are inclined to focus more on themselves as a teachers and less on extraneous tasks, such as integrating technology into the curriculum, a host of internal and external factors can affect their development. Several themes gleaned from the relevant literature include stages of teacher development, knowledge and confidence surrounding

technology, access to technology, outside support, prior experiences, and willingness to learn something new.

The literature suggested that first-year teachers underutilize technology within the classroom and rarely integrate it into the curriculum because of a variety of external and internal factors based on the teachers' developmental level. However, there is very little literature that suggested that teachers, as they begin their teaching careers, have genuine concerns regarding technology and what those specific concerns may be. As a result, this study examined both the concerns of first-year teachers and the various external and internal factors that affect first-year teachers' use- or nonuse-based concerns.

CHAPTER THREE

METHODOLOGY

This study examined first-year teachers' level of technology use and explored factors that contributed to an understanding of technology use in their classroom. Various external and internal factors contributed to the success or failure of technology integration in the classroom. This study sought to answer the questions:

RQ1. What are first-year teacher's concerns towards the use of technology in their classrooms to achieve higher-level learning as shown by their score on the Stages of Concern Questionnaire (SoCQ)?

RQ2. What do first-year teachers express as their concerns with technology use?

Participants

Participants were from a voluntary pool of first-year teachers located in central and western Kansas. The goal was to obtain data from as many first-year teachers who have recently graduated from post-secondary institutions and were in their first year of teaching. The researcher had access to Kansas Board of Regents Universities where recent School of Education graduates would be seeking employment as first-year teachers, as well as within local school districts. It was assumed that first-year teachers had some type of technology course in their education courses, as well as had access to some type of technology in their new classroom. The voluntary participants were primary and secondary first-year teachers and remained anonymous throughout the research process with regard to reporting data.

Instruments and Analysis

In the first phase of research, the CBAM instrument with four components was used to measure the concerns of first-year teachers regarding technology use. The first phase consisted of initial contact with the participants, gaining their consent, administering the Stages of Concern Questionnaire, and gathering demographic data. The questionnaire was administered to teachers in the spring and fall of 2011 via Survey Monkey, a Web-based program. The second phase of the study used structured interviews conducted in a semi-structured format; however, follow-up questions were used to glean more information based on the teachers' responses (Merriam, 1998).

During the first phase, first-year teachers responded to a 35-item questionnaire (SoCQ) that originated from the first of the three-part CBAM. The 35-item questionnaire is a 0-7 Likert scale in which participants marked how true the item seemed to them at the present time, where 0 meant that the technology use was completely irrelevant to them. In order to comply with the prior research regarding the SoCQ, none of the items were rearranged in order and the only word changed was the word "innovation," which was changed to "technology use." Any change to the items risked the reliability and validity of the tool. Demographic information was also gathered in which a few questions were modified and a few questions were added to extract information important to this study. The use of open-ended questions provided valuable background regarding the interpretation of the SoCQ profiles.

The SoCQ was administered to gain more insight into the varying stages of individual concern regarding first-year teachers and their use of technology. The CBAM was developed based on the research of Fuller (1969) and others (Hall, Wallace & Dossett, 1973; Hall & Hord., 1987)) in response to change within the educational process. Over 30 years ago, single

innovations were introduced in individual teachers. Since then, the CBAM model has continued to encompass newer innovation implementations within education that include teaching cadres or instructional groups. The focus of the CBAM is to measure implementation of new practice or innovation within a school setting; in this case, technology use. How do teachers feel about the new innovation or practice? This means technology use within preservice education courses and first-year teaching can drastically change based upon personal exposure, experience in preservice courses, student teaching, and the individual districts in which the teachers are employed.

The SoCQ was developed for use as one of three diagnostic tools that are part of CBAM, which is a framework for measuring implementation and facilitating change within schools. The SoCQ allows a researcher to understand how teachers feel, or their concerns regarding strategies, programs, or materials initiated in a school. By understanding teacher concerns and addressing them, a researcher can fully assess the extent of implementation and/or guide teachers through the change process. In a complex world, concerns can arise as teachers respond to any stimuli or conditions they encounter. Simply, concerns are the outcome when a teacher's feelings or thoughts are heightened by something. There are varying types of concerns at varying levels of intensity. Nevertheless, concerns are an important part of the change process and teachers' views of the innovation or situation. Concerns are multifaceted and can arise at various stages of the change process. They also vary depending on teachers' knowledge and experience with the specific innovation.

Seven stages of concern about an innovation have been identified. They are often identified as stages because teachers generally move through them developmentally. This means that teachers have one type of concern about the innovation and, as that decreases, another

concern(s) can arise. Similar to Fuller's (1969) work about teaching concerns, the Stages of Concern progress from little or no concern, to self or personal concerns, to adoption of the innovation, and to concerns about the impact of the innovation on students. The SoCQ portion of the CBAM is the primary tool used to identify individual stages of concerns for each teacher. Developers of the SoCQ viewed concerns as a developmental process in which earlier concerns must be resolved (low intensity) before later concerns can emerge (increase in intensity) and be addressed (George, Hall & Stiegelbauer, 2006). Concerns are viewed as highly personal, and individuals must decide on their own whether they will change or not change. The SoCQ is not used to manipulate teachers into using the innovation, but rather to recognize concerns, offer solutions and help teachers cope with and, hopefully, resolve concerns.

Individual Interviews

The use of a mixed methodology in research can help to validate an individual researcher's findings, as well as provide individual dialogs and personal insight for participants in the study. One major technique to collect qualitative data is individual interviews. Essentially, they are "a way of listening to people and learning from them" (Morgan, 1998, p. 362). As a second phase of this study, individual interviews were used to discover where teachers were placed into potential categories based on the literature review, thus creating an individual profile for each participant. The literature review was used as a guide, but not seen as a static portion of the research process. As themes were established prior to data collection, they were connected to SoCQ data, as well as interview data. Using the Southwest Educational Development Laboratory's (SEDL) program, the individual raw data were entered into a CBAM computer-based program to generate individual profiles for each participant. Using SoCQ data, the SEDL program plots individual profiles

concerning each participant's level of concern, as well as plots the group as a whole. The Profile Interpretation method of analysis was employed to assist the researcher with regard to knowing more about both the teachers individually and the group as a whole regarding concerns with technology use. Analyzing concerns profiles involves looking at tabular listings of percentile scores or the plot of those scores on a graph, which will then produce a complete interpretation and assessment of data. This type of analysis can help researchers understand the varying degrees of concerns (most to least), as well as establish a stance that the individual teacher is taking regarding technology use or innovation.

After analyzing the graphs and output for peak data, it was the researcher's goal to use more in-depth, qualitative methodologies with specific teachers to gain more perspective and insight that might not have been evident from the SoCQ data. The purposeful selection included approximately three first-year teachers from the pool of participants that scored in the two highest levels of SoCQ data, or using the First and Second High Stage Score Interpretation. This means the two highest sets of concerns were those looked at with regard to the innovation. The use of semistructured interviews and teacher-generated documents (e.g., course materials) provided multiple data sources to be triangulated (Lincoln & Guba, 1985). With the use of multiple sources, it was the goal of the researcher that those items would describe individual stories in relation to first-year teachers' concerns surrounding technology use. Although this additional exploration cannot be generalized to a greater population, the added insight helped to shed light on the personal side of the classroom and provide genuine context and depth to the research and everyday practice (Merriam, 1998). Information gained from individual interviews was typed and

transcripts reviewed by participants (member check) to insure that the narrative was reflective of the findings.

Data Collection

SoCQ

The SoCQ was administered to 22 first-year teachers in either primary or secondary education in the state of Kansas. It took approximately 15 minutes for respondents to complete the 7-point Likert Scale for each item. The data were scored by using two methods included in the Stage of Concern Manual (George, et al., 2006). Scoring of the SoCQ was done by assessing the graphic profiles and Stages of Concern using the SEDL software that was developed and maintained by experts for research using the CBAM. Interpretation of the SoCQ profiles was done with varying levels of sophistication from raw scores to percentiles and graphical representations. The method used in this study identified those Stages of Concern based on profiles of the group and individual data. The intense concerns were noted by looking at "peaks" in the graphical profile, and then interpreting those stages according to the paragraph definitions provided by the CBAM interpretation tools. The First and Second High Stage Score Interpretation was employed with this study, in which the researcher examined the highest and second highest stage scores. Interpretative assistance was available in Hall, George and Rutherford's (1977) "Measuring Stages of Concern Manual," which was also included in the SoCQ appendix along with the procedures of scoring. The manual provides additional support regarding scoring with a proprietary computer-based program (developed by SEDL) that uses the raw scores and provides output based on the participants both as a whole and individually. Although the device has been tested for reliability and validity by the SoCQ creators, the researcher also hand-graded five

individual questionnaires and compared those with the computer scoring device to verify that all computer output being used was accurate.

Observation/Interview

The SoCQ was analyzed and the highest and second highest levels were used to determine graphical and numerical representation. After identifying those participants in the two highest levels, three participants (n=3) were interviewed to gain further insight into the teachers' concerns with regard to technology and the classroom climate. It was important to note what challenges individual first-year teachers are facing in general, but also the variables that are contributing to technology implementation in the classroom. The interview transcripts were analyzed using pattern-seeking methodology and triangulated with the SoCQ and other materials to determine first-year teachers' impressions of the internal and external factors that affected first-year teachers' technology use in the classroom. The patterns or themes were guided by current literature with regard to first-year teachers, but were also expanded and added to as more insight was gained from individual interviews. Some of the external and internal factors, as mentioned in the relevant literature, which could potentially be of importance are: (a) mentoring, (b) student teaching experience, (c) self-concerns, (d) access to technology, (e) support, and (f) continuing education. Are there others? There are other factors that could be generated from the data to contribute to the base of knowledge and understanding of first-year teachers' concerns.

Analysis efforts focused on comments that either supported or negated quantitative findings in order to extend or modify results. Triangulation helped alleviate researcher subjectivity, as the qualitative data is either congruent or incongruent with the collected quantitative data (Bogdan & Biklen, 2003).

Definition of Terms and Limitations

Definition of Terms

The following definition of terms is included to clarify understanding with respect to this study.

CBAM: The CBAM is "a conceptual framework that describes, explains, and predicts probable teacher concerns and behaviors throughout the school change process" (George, Hall & Stiegelbauer, 2006, p. 8).

Concern: A concern is "the composite representation of the feelings, preoccupation, thought, and consideration given to a particular issue or task" (Hall, George, & Rutherford, 1998, p. 5).

External Factors: External factors are environmental or "extrinsic factors for example: professional development; influential people; administrative, parental, peer, and technology support; Internet, hardware, and software access" (Ertmer et al., 2006).

Innovation: Innovation is a generic name given to an object or situation that is the focus of the concerns. "It may not be new. A new strategy, program or practice, or something that has been in use for sometime" (George et al., 2006, p. 7).

Internal Factors: Internal factors are self-relating or "intrinsic factors (e.g., inner drive, personal beliefs, commitment, confidence, and previous success with technology" (Ertmer, Ottenbreit-Leftwich, & York, 2006).

Stages of Concern Questionnaire (SoCQ): The SoCQ is an instrument designed to measure the concerns of individuals as they engage with a new program or practice (Horsley & Loucks-Horsley, 1998).

Technological Innovation: Technological innovation is the development, introduction, and dissemination process association with new knowledge-derived tools, artifacts, and devices by which people extend and interact with their environment (Tornatzky & Fleischer, 1990).

Technologies: Technologies are tools or tool systems by which we transform parts of our environment, derived from human knowledge, to be used for human purposes (Tornatzky & Fleischer, 1990).

Limitations

Limitations within this study involve the use of technology as a means of collecting data from participants. With technology or "electronic means" of data collection, various attributes can affect the outcome when using email or electronic applications, which could include: human error, fear of technology use, anonymity concerns of the participant, and failure of the technology to work the way the researcher and/or participant perceived.

Attrition is major concern for any study where researchers rely upon humans for their data. Due to time and distance, participants may leave the study and this is an issue that has to be considered when collecting data and making conclusions about the sample.

Distance between the researcher and the participant was an issue if they live far away from each other and observations and personal interviews are not possible. A limitation could also be the regional responses that the questionnaire generates. That is, all participants in this study were from the Midwest, and, therefore, with the small sample size and limited diversity, the results are not transferable to a greater population.

The availability of first-year teachers to be studied is also a concern, as there are fewer and fewer school districts hiring new teachers when they can easily hire from within or pay to educate a veteran teacher to fill the position that would have been occupied by a new teacher.

The results of the study were useful in gaining perspective in relationships among variables; however, cause and effect cannot be established with the use of a correlation analysis. The information gathered from this research could suggest or provide insight for Schools of Education, teacher-educators, mentors, school districts, and first-year teachers. The multiple concerns of first-year teachers will shed light on intervention and possible support avenues in technology integration.

As always, when qualitative methods are used, the research is the lens through which all the data are flowing. The use of ethical decisions and sound approaches were the pinnacle for reporting what was interpreted via the research as to what was happening in the environment. All information in the survey was self-reported data. The information provided was based exclusively on the perceptions of the researcher concerning the participants. A member-check of the interviews was helpful in providing rigor of the data. There may be unexamined factors affecting the relationship between technology use by teachers and their instructional practices that are not accounted for in the methodology.

Another limitation of this study is external validity, or the extent to which findings from this study are generalizable to a larger population. External validity is a typical consideration for case study research (Bogdan & Biklen, 2003; Yin, 2003).

Data Analysis

The CBAM stems from over 30 years of work by Fuller and others (Hall, Wallace & Dossett, 1973; Hall & Hord, 1987) in response to educational change regarding various innovations. At the University of Texas-Austin, researchers began to delve into greater investigations of what happens when individuals are asked to change their practice or adopt a new innovation (Hall et al., 1973). Hall and Hord (1987) proposed the use of three distinct tools to further describe, explain, and predict teachers' behavior during the change process. The CBAM theory "launched a set of exploratory and descriptive studies to further elaborate the concept of concerns and to develop procedures for assessing concerns" (Hall, Newlove, George, Rutherford, & Hord, 1991). From Fuller's research and the development of CBAM, the SoCQ was an outcropping of one of three tools for understanding concerns that were employed in this study.

The analysis of the SoCQ was strictly based on the guidelines set forth by the creators of the instrument (Hall, George, & Rutherford, 1977). The instrument has four parts: (a) the cover letter, (b) the introductory page, (c) two pages of statements or items for the participant to evaluate and (d) a demographics page. The analysis of scores was based on the SoCQ Manual. The manual, prepared by Hall et al. (1977) included scoring based off the raw scale scores, raw scale totals and percentile scores. Those scores were calculated into individual scores that become the basis for constructing the SoCQ profiles. With regard to the instrument, the 35 statements or items were administered via an online survey (Survey Monkey) in which respondents marked each item based on a 0-7 Likert scale. The "0" at the low end of the scale represented those items that are completely irrelevant, which were sufficiently defined on the introductory page of the electronic questionnaire. Because the instrument is based around testing an innovation, the only portion of

the instrument that can be changed is the name of the innovation. In this case, innovation was replaced with the term "technology use" (new to them as first-year teachers). The validity and reliability of the instrument would be compromised if the wording or order of the statements were displaced or changed (Bradburn & Sudman, 1988). For this study, the order of the original questionnaire as set out by SoCQ was not changed, and the only wording added or changed was the substitution of "technology use" for "innovation."

Scoring of the questionnaire requires the calculation of raw scores for each of the seven stages or scales, then locating the percentile score for each scale in a table. The last step is plotting the results in a graphical representation, also called the Stages of Concern Profile chart. The Southwestern Educational Development Laboratory, along with CBAM researchers, developed a computer-based program in which raw scores are input into an Excel program and those scores are then translated into data to reflect the groups' and the individual teacher's Stages of Concern. In addition, the researcher tested the program by scoring five of the respondent's data by hand to verify computer output. The raw data represent the output of the 35 statements, each expressing the individual's concern about the use of technology in his or her particular school. Each statement of the questionnaire was carefully selected, according to the concerns theory, to represent the fundamental Stages of Concern and then grouped them according to the various stages.

During the data-gathering process, two participants had missing or blank data that had to be accounted for with regard to responses. However, because the original scoring procedure was calculated on raw scores, their nonresponses were ultimately calculated as zero. Therefore, they did not affect the raw data and thus effect the percentile calculations in relation to output by the

each individual. The SEDL-developed computer-based tool was used to calculate the data and allow for output, as well as profiles for each individual who completed the questionnaire. Analyzing the SoCQ data by means of Profile Interpretation and the use of peak scores (most intense concerns) can be both individual and group-based. Data can be converted into a group "score" or overall picture of the participants' responses regarding their concerns; however, the SoCQ was meant to be interpreted as individual scores, thus looking at each individual and his or her focused concerns with regard to technology use within his or her school. Each participant in the SoCQ generated raw scores, thus producing output in the form of individual item analysis, encompassing the raw score for each question focused on the seven stages, totals for each stage and percentiles. Finally, SoCQ data were interpreted in order to make predictions about the possible subject responses in open-ended interviews regarding concerns. Comparisons were drawn between the predicted concerns and the verbally conveyed actual concerns (Hall et al., 1977).

The SoCQ was originally validated in 1977 (Hall, George, & Rutherford) and has been validated numerous times since its creation as it has been used in many studies in succeeding years. Cronbach's alpha was used to establish the instrument's internal validity, with a sample (n=830) of teachers involved in team teaching and professors concerned about innovation. A sub sample (n=132) participated in a test-retest of the instrument over a two week period. Alpha coefficients ranged from 0.64 to 0.83, and the test-retest correlation ranged from 0.65 to 0.84, indicating the internal consistency and stability for each of the seven stages (Hall et al., 1977). For the purpose of construct validity, the questionnaire was shared and administered via several

Instructional Technology faculty members from Kansas Board of Regents institutions. They identified the points of vagueness and suggested various changes for clarity.

The 35 items that make up the SoCQ are divided evenly across the seven stages of concern, resulting in a five-item raw score. SoCQ data can be reported in several variations that differ in complexity. The most often reported data reflect the peak stage concerns and secondary stage concerns scores of individual respondents; these data reflect SoCQ raw scores that have been converted to a percentile scale. Greater analyses were conducted to illustrate either individual or group concerns profiles across all seven stages of concerns (Hall et al., 1977). These analyses were conducted using the initial SoCQ raw scores.

Questionnaire

The SoCQ is a four-part instrument: (a) the cover letter, (b) the introductory pages, (c) two pages of statements or items, and (d) the demographic page. Scoring is based on "converting the item(s) raw score totals for each scale into percentile scores that become the basis for constructing the SoCQ profiles, making the interpretations much more holistic" (George et al., 2006, p. 23). The purpose of the interviews was to obtain rich data that framed the connection between the technology use as reported by the SoCQ, and the participants' own personal experiences.

The cover letter, in this case, was used to put the survey into context and explain the purpose of the questionnaire. It also included the University of Kansas Human Subjects clearance, informed consent, and the contact information for the principal investigator and advisor.

The introductory page included the purpose of the questionnaire, plus an example illustration and explanation of how the instrument was to be completed. There was also additional

space for the participant to provide optional identification and numerical identification for the researcher with regard to the site or school from which the data were collected.

The actual instrument developed for this study was based on the original SoCQ and was altered only by changing the word "innovation" to the words "technology use." Altering of the original tool is strictly prohibited if the questionnaire is to remain valid and reliable as long as the innovation is clearly defined to the participants as specified in the SoCQ manual. Typically, it is best for respondents to answer individually and the questionnaire usually requires 10-15 minutes to complete. An open ended segment was added by the researcher to allow the participants to add additional comments regarding the 35-item questionnaire and their technology use.

The final portion of the questionnaire is the demographics page in which data are gathered concerning both sample description and correlation purposes. Questions within this portion may be altered, added to, or deleted; however, the additional descriptive data that are obtained assist in an understanding of the individual subject. In addition, other open-ended questions can be included within this segment to provide valuable context for interpretation of the SoCQ profile(s). This portion of the study also included questions regarding years of teaching experience, self-rating as a technology user, additional formal training in technology use, any technology-based initiatives that the teacher might be integrating, and contact information. As with the entire questionnaire, all answers were completely optional and would not alter the core data or 35 items regarding their concerns about technology. The qualitative data helped provide more insight into the individual and assisted with potential follow-up questions during the interview portion of the qualitative data. The SoCQ group and individual data, as well as the qualitative data, were analyzed and used to answer Research Question 2.

Procedure

The Stages of Concern Questionnaire was administered to 22 participants who were given all four parts of the questionnaire, including informed consent. Of the 22 first-year teachers surveyed, 17 females and 5 males teaching were either elementary or secondary education within central or western Kansas (Demographics diagram). Raw and percentile scores for each participant's concerns questionnaire were calculated according to the Likert-scale analysis procedures set forth by the developers of the SoCQ. Analysis includes a comparison of each participant's percentile scores for the seven stages of concern (e.g. unconcerned, information, personal, management, consequence, collaboration, refocusing) in comparison to the percentile scores for the other participants using a scoring guide provided by the creators of the SoCQ. Although the data was entered into a program for scoring data, the data was also hand scored to verify computer output. The data output was both individual and group based. The questionnaire consisted of 35 items, each asking the participant to express his/her concern regarding the use of technology in the classroom. Participants indicated the degree of concern by marking a number on a scale of 0-7 by each statement. High numbers indicate high concern and low numbers indicate low concern, where zero indicates very low concern or completely irrelevant items. All 35 items included in the SoCQ were congruent with Fuller's Concerns Theory which represents the seven stages of concern and was not altered in any way as set forth by the developers of the SoCQ. Any missing data or zeros on the questionnaire items were calculated as an average of the responses marked within that scale. This means items 3, 12, 21, 23 and 30 address the Unconcerned or Awareness Stage of the innovation. If one item was skipped or had a zero response, it was calculated as an average of all the other responses within that stage or category. However, if the

questionnaire was incomplete, meaning the participant started the questionnaire but did not finish, his or her data were not included in the final data set. However, such participants' demographic data were preserved and used for qualitative information or data with regard to the group. This preservation allowed not only greater insight regarding each respondent's concern with technology, but also greater insight on the technology being used within the respondents' school districts.

Each participant's scores were used to calculate a mean percentile score for each given stage of concern. The mean percentile scores were used either to support or refute the Peak Analysis as set forth by the SoCQ in which the highest peaks are investigated because they are the largest areas of concern for each teacher. Additionally, posthoc analysis procedures were employed in order to highlight the primary and secondary stage(s) of concern reported for each participant (0, 1).

One way of looking at group concerns is to aggregate individual's data by developing a profile that provides the average scores for each stage of the individuals in a group. Typically, the group averages will reflect the dominant high and low Stages of Concern of the entire group. Participant responses on the SoCQ were initially analyzed using the SoCQ 075 Scoring Program using Statistical Analysis Software (SAS), which computes raw scale scores, percentile scores and group averages. Mean scores were converted to percentiles and plotted following the procedures outlined by Hall, George, and Rutherford (1998) using the SoCQ Score Program. The first and the second highest stages of concern for all respondents were analyzed for possible patterns along with the lowest stage of concern. According to Hall, George, and Rutherford (1977, identifying the

second highest stage of concerns along with the peak stage (highest) can develop a profound understanding of the dynamics of concerns of the group.

Individual Interview

During the second phase, the researcher conducted individual interviews that were purposefully selected from within the two highest areas of concern (peaks) from the SoCQ output within a formal and semi-structured nature (Merriam, 1998). The questions addressed in the individual interviews were modified from Franklin and Molebash's (2007) survey distributed to the teachers regarding technology use (see Appendix C). The teachers were asked to review the interview transcript following the interview, make necessary changes, and then return the document to the researcher electronically (email). This process served as a member check for the interview, providing the participating teachers an opportunity to review or clarify their statements following the interview.

The three participants were randomly chosen from the two highest stages of concern and were asked to collect course materials that they used in the classroom during the 2010-2011 school year concerning syllabi, for example, larger projects and assessments. The course documents were collected in an attempt to establish and provide additional insight into the participant's teaching style, philosophy, use of technology, and types of technology implemented, along with the interview questions that approached the same inquiry. This information also provided the researcher with more information regarding who the teacher was as an instructor and more about their curriculum and possible technology use within their teachings.

Information from the individual interviews was analyzed using descriptive statistics and the constant comparison method (Glaser, 1965). For the analysis of the qualitative data, several

prior themes were derived from a review of the literature. These themes included use of technology, teacher stages of development, and internal and external influences. Themes were added and revised throughout data collection and analysis (Merriam, 1998). Following an initial review of the qualitative data, the themes were modified to barriers, concerns toward technology, and teaching and learning. These three themes were then used in the further analysis of the data. Within these themes, additional categories emerged during data analysis. To ensure reliability in data coding, a second researcher was asked to code multiple sections of the interview transcripts, which resulted in a high inter-rater agreement (90.4%).

CHAPTER FOUR

RESULTS AND DISCUSSION

Chapter Overview

The purpose of this study was to investigate the concerns that first-year teachers have with regard to technology use within the classroom. In this study, a descriptive methodology incorporating qualitative and quantitative analyses were used in an effort to answer the questions guiding this study. The following research questions were explored:

1. What are first-year teacher's concerns towards the use of technology in their classrooms to achieve higher-level learning, as shown by their score on the Stages of Concern Questionnaire (SoCQ)?

2. What do first-year teachers express as their concerns with technology use?

To address these research questions, the SoCQ portion of the CBAM was administered in the fall of 2011. Additional follow-up interviews were administered to a subset of the questionnaire sample. The questionnaire captured potential concerns that first-year teachers may have experienced as they obtained their first teaching job and used various technologies in their classrooms. The SoCQ is shown in Appendix C.

This chapter includes the findings for the demographics of the teachers studied, the SOCQ quantitative data and results from which participant responses were analyzed and framed within the before-mentioned research questions. Next, a qualitative analysis was performed using three purposefully chosen individuals from the highest SoCQ levels. Then, individual feedbacks from interviews conducted were analyzed to gain a better understanding of, and insight into, the individual teacher. Lastly, overall quantitative and qualitative results are discussed.

Demographics

A total of 22 first-year teachers participated in the study. The majority of the participants (91%) in this study were between the ages of 21 and 30; 9% were between the ages of 31 and 40; and there were no participants in the older categories. Two individuals were over the average age of first-year teachers because they were previously on different career paths and obtained a teaching degree later in life. The majority of those surveyed were female (77%), and 23% were male. The demographic data show that the majority of first-year teachers who served as participants had their bachelor's degree; however, one participant had a master's degree because she or he had gone back to school later in life to obtain a teaching degree.

To verify they were first-year teachers, all participants in the study were asked how many years they had been teaching. All of the participants verified that the survey was completed during their first year. Participants were also asked if they had obtained technology training within their first year of teaching. Although some of the teachers answered the questionnaire at the end of the first semester of their first year and others completed the questionnaire at the beginning of the second semester of their first year, 100% of the participants answered that they had received 0-30 hours of training regarding technology use in their classroom.

Of the 22 participants, all but one (86%) had access to a computer at home, while one person (5%) did not. Nine percent of the participants did not respond to this question in the demographics section, and two of the 22 participants did not report how long they had used technology, whether for personal or professional use. One teacher (5%) confirmed having had 2-3 years of experience, and the remainder (86%) stated they had over 3 years' experience using computers. Lastly, 20 of the 22 teachers (91%) reported that they had time within their teaching

schedule to prepare or train during school hours, and two participants did not respond to this question. Table B1 shows the participants' demographics collected through the SoCQ.

Quantitative Analysis

Interpretation of the scores are based on guidelines contained in "Measuring Stages of Concern about the Innovation: A Manual For Use of the SoC Questionnaire" (Hall et al., 1998). In order to understand the output, the raw scores for each for each of the seven stages, or scales, then the percentile scores for each scale in a table were located and the results plotted on the SoCQ chart that is included with the SoCQ Manual. Although the manual contains a CD to assist in computing individual and group profiles, five of the 22 questionnaires were hand scored and used to verify computer output. In addition, to verify the output, the researcher submitted data to the Southwest Educational Development Laboratory (SEDL) for updated output based on the newest program developed by the SoCQ researchers.

The first research question for this study was: What are first-year teacher's concerns towards the use of technology in their classrooms to achieve higher-level learning as shown by their score on the Stages of Concern Questionnaire (SoCQ)?

To answer this question, the research used a concerns-based tool called the CBAM. From over 30 years of development, three tools had been developed to assist in understanding concerns with regard to teachers and various school implemented innovations. In this case, the innovation was technology use in the classroom. One of the three tools, the SoCQ, housed under CBAM, was administered to 22 first-year teachers. Output from the SoCQ group data was used to determine the main concerns of first-year teachers, as well as understanding where they fit individually in the stages of concern.

Table 1

Demographics of Participants

Variable	Number	Percent
Age		
21-30	20	91%
31-40	2	9%
41-50	0	0%
50+	0	0%
Gender		
Male	17	77%
Female	5	23%
Grade Taught		
PK-K	0	0%
1-5	6	27%
6-8 (Middle School)	4	18%
9-12	12	55%
Highest Degree Earned		
Bachelor's	21	95%
Master's	1	5%
Hours of Technology Training Received in the Past Year		
0-30	22	100%
31-50	0	0%
51-70	0	0%
70+	0	0%
Home Computer		
Yes	19	86%
No	1	5%
Missing cases	2	9%

(continued)

Table 1: *Demographics of Participants* (continued)

Variable	Number	Percent
Length of Technology Use		
0-3 months	0	0%
3 months – 2 years	0	0%
2 years – 3 years	1	5%
Over 3 years	19	86%
Missing cases	2	9%
Time for Technology Training/Preparation Provided During School Hours		
Yes	20	91%
No	0	0%
Missing cases	2	9%

The group results from the SoCQ illuminated the overall picture with regard to first-year teachers and their use of technology in the classroom. The results were aggregated raw scores (Table B1, Fig. B2) that were then analyzed as percentiles graphed to show the peaks of the data based on the seven stages of concern that are set forth and measured by the SoCQ. The mean scores were then computed. The mean scores were converted to percentile scores in order to interpret the results. The percentiles are represented numerically in Table B1-4 and graphically in Figure 1 for the aggregate.

The high stages or peaks regarding percentile scores are all within the initial stages of concern ranking from 81% (Awareness/Unconcerned) to the second highest stage (78%) which was in the Personal stage of concern for the group. The first and second highest stages both illustrate the participants' potential lack of concern about the use of technology in the classroom, the need for involvement, and the ability to meet the demand of the using technology. It also highlights the second highest percent in which the individual is analyzing his or her role with

technology use in the classroom, personal commitments, and possible implications regarding financial or personal status when using technology.

Table B2

Group percentiles for each Stage of Concern.

Stage	0	1	2	3	4	5	6
Mean %	48	71	74	49	73	79	72
Percentile Score	81	75	78	52	38	59	69

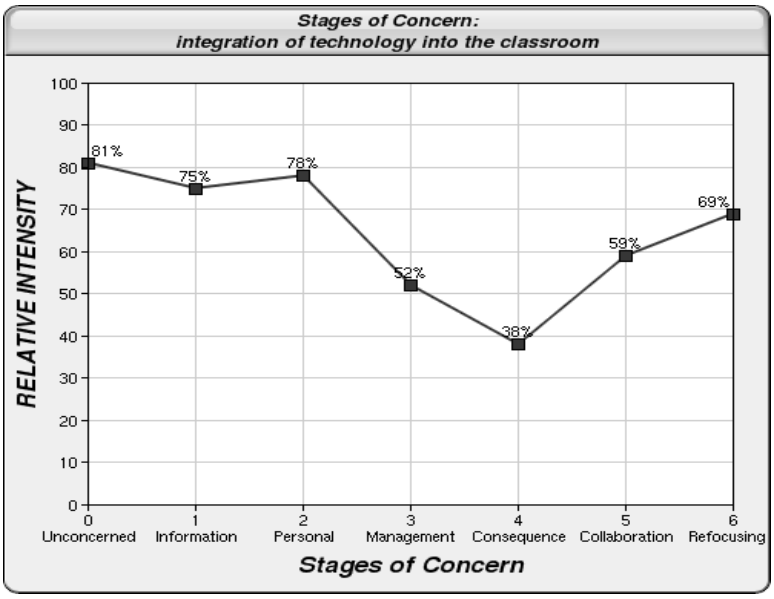

Figure 1. Group graph of the percentiles for each Stage of Concern.

Although the group data give a general feel for the concerns regarding this population of first-year teachers, it cannot explain or expand the in-depth understanding of each teacher and his or her concerns with regard to technology use. Examination of the individual teacher will paint a richer picture of how teachers view technology use and expand their answers both quantitatively and qualitatively. As with any research, the interpretation of all scores that make up this data set

may be approached with caution because of the genuineness of the participant's responses, the ability and skill of the researcher, and overall caution that the data are considered a final "truth" to the research question(s).

As a group, the graph (Fig. 1) can be interpreted by looking at the entire profile. The aggregate data show that individuals are moving from a nonuse of technology in their classroom, perhaps resisting the use of technology. The 22 participants' concerns are most intense at the Awareness (81%), Informational (80%) and Personal (78%) stages. The relationship between the Informational (Stage 1) and Personal (Stage 2) stages can be very important; as well as their relationship to Stage 6 (Refocusing). Stages 1 and 2 are shown as the highest concerns for the group, inferring that the group as a whole is interested in learning more about the innovation, but may be unsure how to do so, because of limited time or simply not having the technology available to them.

The middles stages (Management and Consequence) are low, denoting their concerns are not focused on the Task or Impact Levels of the Stages of Concern. The Management Stage (52%) is the only Task-oriented stage and points towards issues of management, scheduling, and organizing of technology in the classroom. It is not seen an issue to the group as a whole.

The Consequence Stage (43%) is the lowest concern for the group and could indicate that teachers are not concerned with the innovation's impact on students; involving its relevance to the student; and evaluation of student outcomes, including performance and competencies.

The other interesting finding in the group data (Fig. 1) is the up tailing of the data at the Impact levels of concern. Stage 5 (Collaboration) increases, but Stage 6 (Refocusing) is the fourth highest concern for the group. The up tailing for the typical nonuser provides additional insight

into the attitude of the group. For 73% of the 22 teachers surveyed, it can be inferred that they have ideas that may be greater than the proposed innovation. Either this means that teachers might prefer to use their own teaching tools or that they could be resistant to the use of technology in their classrooms.

Individual data were also gathered using the SoCQ 075 computer program developed by Hall et al. (2006) contained within the SoCQ manual. As well, raw scores were calculated for each of the seven stages, or scales; then the percentile scores were determined for each scale in a table and the results were plotted on the SoCQ profile chart. Hand grading was used to verify output. Individual data were used to look at the greatest concerns and place them within a Stage of Concern to better understand how they feel about technology use.

Individual Quantative Data Analysis

Gaining general insight into each individual's concerns and issues regarding technology use in the classroom helped the researcher better understand how teachers view technology and how they can be supported to further their use of technology in the classroom. According to the SoCQ, three first-year teachers' data had notable or similar concerns when compared with the aggregate data based on peak concerns or the highest concerns. As a means to understand individuals and their stories further, individual interviews were conducted to glean further insight into the concerns of three first-year teachers. It was attempted to discern if these three participants provided some insight into why nearly 50% of the 22 participants who completed the SoCQ were primarily in the Awareness, Information, or Personal Stages of Concern?

Participant 7, Amanda, had a typical nonuse profile where Awareness (91%), Informational (95%), and Personal (96%) were her greatest concerns. Participant 4, Kelly, also

had a similar nonuse profile where Awareness (98%), Informational (93%), and Personal (94%) were her greatest concerns. Lastly, Participant 9, Jean, had a typical nonuser profile where Awareness (69%), Informational (66%), and Personal (65%) were her highest peaks or greatest concerns.

In numerous studies conducted by researchers who have used the SoCQ with adults, growth patterns have typically been exhibited by movement through the stages, which begin in Stage 0, with an upward progression or an increase of two or more stages (Atkins & Vasu, 2000; Rakes &Casey, 2002; Vaughn, 2002). This is a potentially positive trend with regard to first-year teachers and technology use as they progress through their teaching career. When making general observations about the group, almost 40% of the first-year teachers shared similar concerns about the SoCQ. Nine of the 22 participants had high concern or peaks in the Awareness, Informational, and Personal Stages of Concern, which are typically viewed as Unconcerned or Self-related concerns. Although they are considered nonusers, it was felt by Fuller (1969) and Hall and Hord (1987) that those individuals within the unrelated or unconcerned group, as well as the self-related concerns group, really do have concerns as teachers, but they not typically associated with teaching itself. The self-related concerns by individuals are reflective of egocentric behavior, general concern for themselves, and potential feelings of inadequacy and self-doubt about their knowledge.

As the group data helps researchers glean insight into the whole, individual data can paint a greater picture of individual teachers and their first-year concerns dealing with technology use in the classroom.

Participant 7: Amanda

Amanda's highest peaks or greatest concerns were Unconcerned or Awareness (91%), Informational (95%), and Personal (96%). Her individual data or profile had the highest concerns in the Self-based concerns, meaning Fuller (1969) would believe her to be unconcerned with the innovation, or technology, and potentially moving in to a more self or personal stage of concern. Fuller considered the more self-based level of concerns as a preteaching or an early teaching phase. This means she rarely has teaching-related concerns and only has vague concerns based on what is considered to be acceptable or anticipated. Amanda could be seen as potentially progressing through stages and moving from an unconcerned or preteaching phase to an early teaching phase (Fuller, 1969, p. 219).

As a side note, Amanda's SoCQ data can also be seen as unusual due to a high peak or concern within the Collaboration Stage of Concern. Peaks in this area of concern, the stages 1, 2, and 3, or self-related stages, can suggest that she has a potential desire to learn from what other teachers know and are doing within their classroom (see Table 3 and Figure 2).

Table 3

Amanda's Raw Scores

Stages	0	1	2	3	4	5	6
	Q3: **1**	Q6: **2**	Q7: **7**	Q4: **7**	Q1: **1**	Q5: **2**	Q2: **1**
	Q12: **1**	Q14: **6**	Q13: **7**	Q8: **6**	Q11: **5**	Q10: **3**	Q9: **1**
	Q21: **7**	Q15: **6**	Q17: **7**	Q16: **2**	Q19: **1**	Q18: **6**	Q20: **1**
	Q23: **6**	Q26: **7**	Q28: **7**	Q25: **4**	Q24: **7**	Q27: **7**	Q22: **2**
	Q30: **1**	Q35: **7**	Q33: **4**	Q34: **4**	Q32: **3**	Q29: **7**	Q31: **1**
Totals	16	28	32	23	17	25	6
Percentiles	91	95	96	85	21	68	11

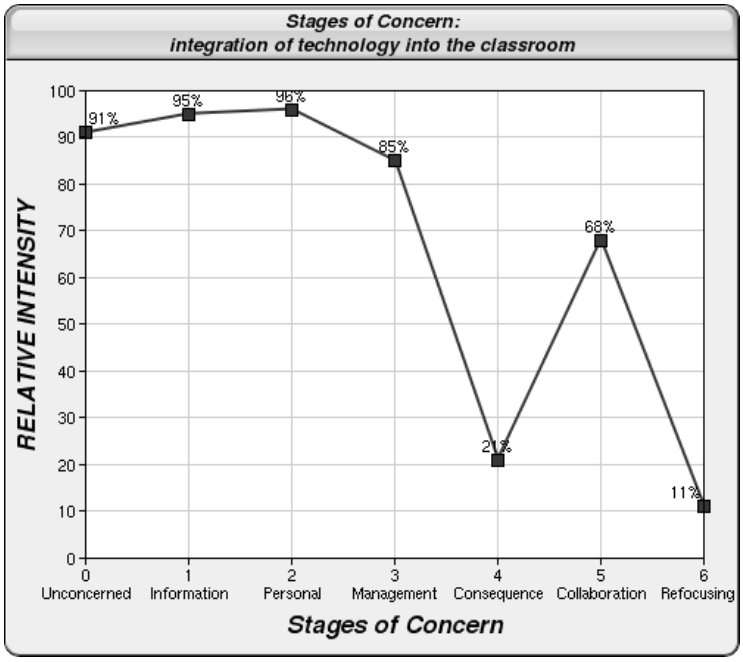

Figure 2. Amanda's Individual Stages of Concern

The question within SoCQ in which Amanda was asked to rate herself with regard to technology use was reported as intermediate. Further insight regarding Amanda is explored in the interview portion of the feedback. She explained to the researcher that she is an "intermediate" user of technology and reported that she had very little, or no, training prior to or during her student teaching experience. In the interview she said that, in hindsight, she wished more had been available or used. She explained, "It [technology use] was not expected" within the course work, meaning they used it for basic applications, but not for real integration into the curriculum.

Participant 4: Kelly

Kelly's highest stages of concerns were the Awareness (98%), Informational (93%), and Personal (94%) levels, which means that Kelly's biggest concerns fell within the nonuse category, but those concerns are not necessarily related to teaching. She is concerned more with her role or self than with the students. In general, Kelly's data are really flat and, although her greatest

concerns are at the more unconcerned or self-related stages, she also has potential concerns in the other stages, but they are not as high or as big a concern at this time (see Table 4 and Figure 3).

Table 4

Kelly's Raw Scores

Stages	0	1	2	3	4	5	6
	Q3: **5**	Q6: **2**	Q7: **5**	Q4: **6**	Q1: **5**	Q5: **4**	Q2: **6**
	Q12: **2**	Q14: **6**	Q13: **6**	Q8: **7**	Q11: **6**	Q10: **6**	Q9: **2**
	Q21: **6**	Q15: **6**	Q17: **6**	Q16: **2**	Q19: **6**	Q18: **3**	Q20: **2**
	Q23: **0**	Q26: **6**	Q28: **6**	Q25: **1**	Q24: **7**	Q27: **6**	Q22: **5**
	Q30: **7**	Q35: **7**	Q33: **7**	Q34: **3**	Q32: **7**	Q29: **7**	Q31: **7**
Totals	20	27	30	19	31	26	22
Percentiles	98	93	94	73	82	72	73

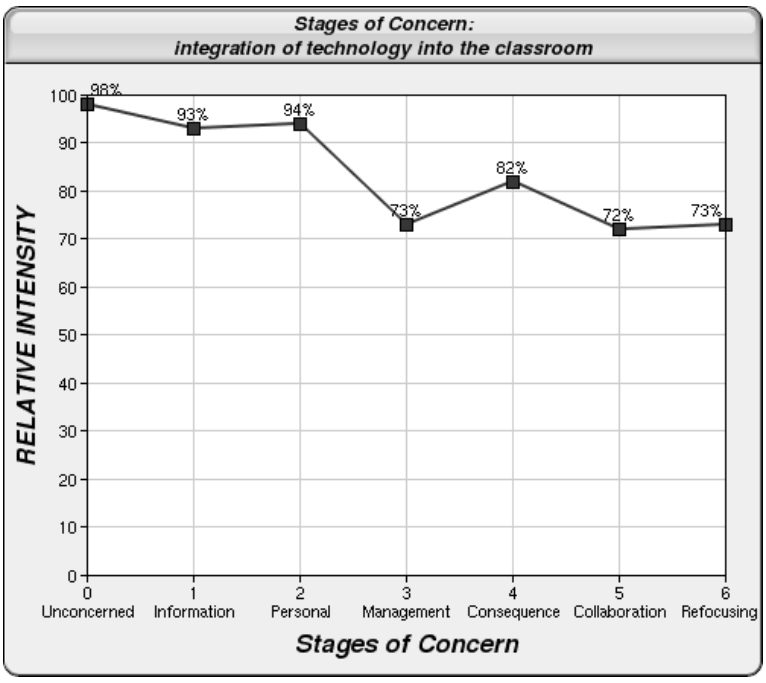

Figure 3. Kelly's Individual Stages of Concern.

Participant 9: Jean

Jean is a nontraditional third-grade teacher in a larger school district in western Kansas. Her SoCQ data show that her greatest concerns are at the Awareness Stage (69%) and her second highest stage is the Information Stage (66%). She is what would be considered, via the SoCQ, as a typical nonuser with regard to the innovation. Jean is in a stage where she really doesn't have any concern with technology, but the Informational Stage, at almost the same percentage, proposes that she is moving towards possibly wanting to know more about technology. The small up tail at end stage could be similar to those feeling expressed in the group data set, which means that they have their own ideas about what works or, perhaps, another innovation that would be better for use. See Table 5 and Figure 4.

Table 5

Jean's Raw Scores

Stages	0	1	2	3	4	5	6
	Q3: **1**	Q6: **1**	Q7: **3**	Q4: **1**	Q1: **1**	Q5: **1**	Q2: **3**
	Q12: **0**	Q14: **5**	Q13: **3**	Q8: **2**	Q11: **4**	Q10: **2**	Q9: **4**
	Q21: **3**	Q15: **5**	Q17: **3**	Q16: **2**	Q19: **2**	Q18: **3**	Q20: **1**
	Q23: **3**	Q26: **3**	Q28: **2**	Q25: **3**	Q24: **5**	Q27: **2**	Q22: **1**
	Q30: **5**	Q35: **4**	Q33: **3**	Q34: **3**	Q32: **2**	Q29: **4**	Q31: **1**
Totals	12	18	14	11	14	12	10
Percentiles	69	66	55	39	13	19	22

Jean's experience with regard to becoming a teacher is different from most in the entire data set. She would be considered a nontraditional teacher because she had a long career as a business owner prior to returning to college and acquiring her teaching degree. She was "at a stage

in my life where I needed a change." Although Jean had been in the business world for many years, she only needed basic technology for her day-to-day operations. The use of technology is foreign to her because she "didn't grow up with technology" like a lot of her peers. This validates her SoCQ peak profile of being a nonuser and not really being concerned with technology use. She did, however, indicate that she is willing to learn, but said that time and not really knowing how to use specific technology are obstacles to using it in the classroom. "It is a bit intimidating to me, so I avoid it [technology use] at times. I am always willing to learn." She also expressed that it is encouraged by her school's administration and stated on her SoCQ that there has not been any professional training on the use of technology. That led the researcher to believe that it is a valued skill, but the attainment of that skill is more self-taught or independently acquired by the faculty.

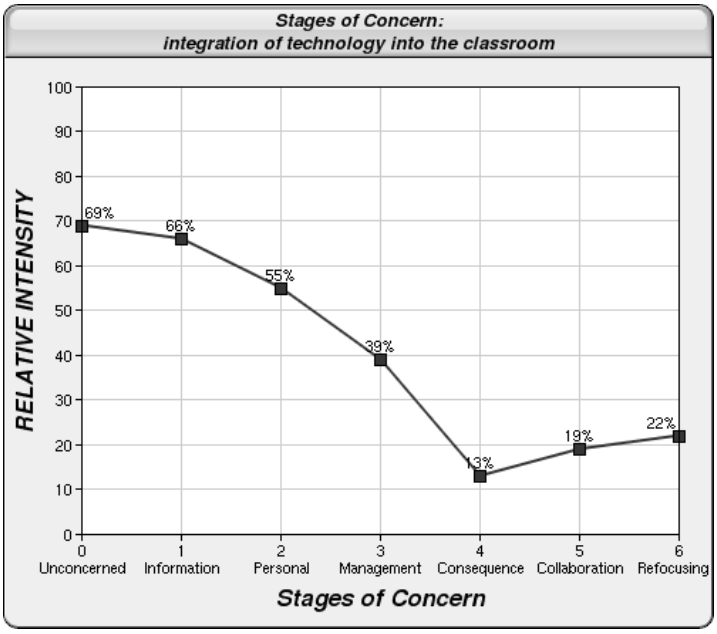

Figure 4. Jean's Individual Stages of Concern.

Qualitative Analysis

The interviewer followed a preset list of open-ended questions based on a previous study (Franklin and Molebash, 2007) that looked at teacher's use of technology; however, the questions were modified to fit the researcher's needs with regard to wording and terminology. As questions were answered, additional data were gathered using either minor questions (Salkind, 2003) or follow-up questions based on individual responses, thus allowing more insight or clarity into each individual's responses.

A large part of this study included the personal affect and insight into first-year teachers' concerns in relation to technology use. The SoCQ helped provide a narrowing or understanding with regard to the various stages of concern that teachers are at with regard to the innovation (technology use). However, individual interviews provided depth and richness to each individual story that enabled a better understanding of the teachers (Appendix D).

Participant 7: Amanda

Amanda is a high school math teacher who is responsible for pre-algebra and algebra courses at a larger, western Kansas high school. She had no prior teaching experience, but had decided on teaching when she helped her mom in the classroom as a child. Amanda reported currently using a Smartboard, clickers, Skyward (online grading software), and a laptop in her classroom. She repeatedly stated that "within the traditional math classroom it can be difficult to use technology." She also stated that she is "willing to try new things, but sometimes it's easier, with the basics of math, to use traditional methods of learning algebra."

Amanda stated that very little technology integration or envelopment of technology into the curriculum was used during her preservice course. Amanda attended a small, Christian liberal

arts college in Kansas and felt that "they (instructors) didn't know that much themselves [about technology]." Amanda has a very pragmatic view of teaching, as she references language like "real world" and does not think students should get hung up on problem-and-answer situations, but more time should be spent focused on the process. She does use technology in the classroom for operations such as grading and basic computing (word processing), but admits she may not know what to bring into the classroom. She is aware there are technologies for the classroom but does not pursue them. She also stated that, as a new teacher, she does not always have the time to look for new innovations for the classroom. With regard to including technology in the classroom, she stated, "it's just easier sometimes…or maybe we don't have that device or technology to do it." She felt one reason for not integrating technology is the budget, or lack thereof, for purchasing equipment for her classroom. She said, "It would be nice if we had a few more things to use in the classroom, but I'm thinking that it comes down to budget."

Amanda mentioned that time is a huge constraint with regard to technology. She felt that, even if she had what she needed,

I think most of the time, barriers to using technology would be actually using it and having the time to figure out what to use, if we have it in the school or can get it then using with your kids and not taking lots of class time figure it out. But kids know so much about technology that it doesn't take long for them to catch on.…I would use it if I knew it would make the things faster or that kids would learn as much as traditional methods.

She stated that they use technology for some testing purposes, and she does not think that computer testing "has affected the use of technology within my classroom." If anything, she stated, that has helped her students.

Overall, Amanda appears to be a willing participant when it comes to the use of technology in the classroom; she cited knowing what is available for use in math, as well as having the ability to change her current practices into something new. She is willing to try different technologies within the classroom as a means of supplementing teaching a traditional subject. She also stated that she might try more things if she knew what "other teachers were doing" and could "watch them."

Participant 4: Kelly

Kelly is a middle-school language arts teacher in a small, rural Kansas middle school. She has been innovative in her class with various types of learning and won a Horizon's Teaching Award by the State of Kansas in 2012. Although her teaching award was for being innovative as a first-year teacher, it was not based upon her innovation with regard to technology and teaching. She stated that she "wished there were more opportunities available" when it came to technology use. The use of basic computer applications, and how they operate, was covered in her one technology course as an undergraduate. In college, she was required to "take one tech course that consisted of making one PowerPoint and presenting it…not real advanced."

Kelly is a teacher who appears to think outside the box. Her teaching philosophy, when coupled with the curriculum and course materials, exhibits a teacher who is not only knowledgeable, but also passionate about her subject matter. She appears to be using higher-level materials in her middle-school teaching and uses a variety of project-based learning to promote higher-level thinking. She discussed her students becoming "more worldly thinkers" and using "reflective journal writings" to grow into "strong writers and thinkers." Kelly appears to have a great command of her subject and seems to be a very competent teacher.

Kelly's concerns are highest at the Awareness or Self-related levels because she really does not have the technology she needs or that she would like to use in the classroom. When asked about technology she said, "I WISH I had an Elmo–I've used one in other teaching experiences and LOVE, LOVE. LOVE it!! I like the Elmo because of all the things that I can do with it, as well as presentation for my students." In her case, it is not that she is not willing, as displayed by her flat SoCQ profile and progression forward, it is that she does not have the tools or technology she would like to have in order to integrate it into the classroom. She expressed frustration that the school budget impedes the use of technology, but she does express the value of technology for learning, as well as student use. "It [technology] really is a must as the world changes every day and they will be expected to know it on some level." Overall, she expressed willingness to try new technologies and said that she will do that if she "has more time and money to explore."

Kelly discussed various technologies that she would like to implement in the classroom, which shows she knows what is available for use, as well as how teachers are potentially using the technology. She would like to be able to afford iPads or Kindle technologies for use in the classroom with regard to iMovie, various applications, and virtual books and readings. The various applications she described as her current technology and those she would like to have suggest her ability to implement technologies (software and hardware) on a higher level. Those tools could help students become "creative and interactive." In her responses, she demonstrated, through thinking about new projects she could implement and grants that could be obtained to offset budgetary issues, that she is a forward thinker when it comes to obtaining new technologies for the classroom.

I plan to continue to look up technologies at home and see what other teachers are doing and how they are using technology. It would be neat to gain more technology in my classroom if there would be more money in my budget or maybe some type of grant.

Participant 9: Jean

Although Jean's SoCQ reflected that she is a "nonuser," she still implements some basic technology within her classroom. She reported that she uses "Elmo daily, my laptop to play songs during calendar time and read books to my class. We use computers daily in the computer lab doing various activities [journal writing, spelling practice, math games, etc.]." Although she showed her basic use of technology within the classroom, she does not engage students in higher-order thinking processes or learning with the use of technology. Jean stated that there is value in constructivist learning processes, but cited time as a huge issue. "Again, it's hard to manage a larger project without the help of a para-professional. She [name omitted] is my savior someday and parents like you who volunteer their time."

Further observation and inquiry revealed that Jean is a very energetic and excited first-year teacher. She genuinely seems thrilled with her choice to become a teacher and really wants to learn and know more; however, she seems to be a bit overwhelmed by the basics of what is expected. She is just trying to stay above water with regard to students, their needs, curriculum expectations with standardized testing, and attempting to keep up with the other third-grade classrooms due to a team-teaching environment. Time is a factor in doing almost anything in her classroom. With regard to technology she expressed that "there is never enough time to plan a lesson and include all the essentials that you need, plus add in technology."

Jean is aware of the expectations that she has for herself as a teacher and for her students as learners. She really is in a fight-or-flight mode regarding teaching and just trying to do her job, but does not have the amount of time needed to investigate and try new things, even if it is not technology use or integration.

I try to treat each child as their own–as their own learners that have different needs and different viewpoints. That is one of the first things I learned as I subbed and then this first year of teaching. There are so many different needs and different learning and it can be difficult to meet all the needs of every student, but I sure try.

Jean is aware of student needs and her needs as an instructor, so her heightened concerns about self are normal in the first year. However, she showed progression toward her actual teaching and how it is affecting student learning.

All participants stated that they are willing to change and see the need for technology in the classroom, regardless of their subject, but stated they rarely use technology (for instruction) because of various constraints, both external and internal, that they face on a daily basis. Various themes were triangulated between multiple data sources and assisted the researcher in better understanding the concerns of first-year teachers with regard to technology use.

Methodological triangulation occurred by implementing the SoCQ data, participant interviews, and the researcher's notes for greater understanding with regard to first-year teachers and technology. Determining areas of agreement and divergence based upon the researcher's own observations and perceptions, as well as seeking reoccurring themes and key words in the researcher's transcripts or field notes assisted in developing an overarching understanding of the

interview results. A matrix based around the seven Stages of Concern was used to organize data from the SoCQ, interviews and researcher notes (Appendix E).

Quantitative Results

This section briefly summarizes the research findings and includes discussion regarding the second research question from the study. The research question that guided this phase of the study was: "What do first-year teachers express as their concerns with technology use? To answer this question, the individual stages of concern of each interviewed participant were gathered from the SoCQ questionnaire and hand-graded using a scoring guide, along with the SEDL electronic software, in order to gain raw scores that were converted to percentiles and plotted on a SoC Profile Chart. The individual profile helped to identify peak, or high, concerns for three first-year teachers regarding technology use. As previously noted, first-year teachers who participated in the SoCQ were identified as having expressions of concern that focused on little concern if any, or more self-related concerns, for example, "I am not concerned about it," or "I would like to know more about it," or "How will using it affect me?"

Although the qualitative data provided a general guide with regard to teachers' concerns and technology use, when data were meshed with interviews and researcher's field notes, more in-depth insights into individual concerns of first-year teachers was provided.

Qualitative Results

Several dominant themes emerged related to first-year teachers and technology use. The importance of budget, time, availability, and training were both extrinsic- and intrinsic-based themes throughout the interviews that were backed up by SoCQ data and expressions of concerns as laid out by the SoCQ model. Statements, such as "I would like to use more technologies, but my

school can't afford to buy them" or "with budget cuts and what not it seems impossible [to purchase technology for the classroom]" identified the notion that budgetary concerns are at the top of the list as a barrier to technology use in the classroom.

Implementing a matrix encompassing the SoCQ results, interviews and researcher notes helped to identify general concerns expressed by the select group of first-year teachers. Although it is not generalizable and caution must be exercised, all participants expressed concerns that were primarily nonconcern or self-related concern. The SoCQ, as well as the interviews, reinforced Fuller's (1969) theory in which teachers often begin in a "pre-teaching" stage, then a stage of "self" in which there is nonconcern that moves into concerns regarding classroom survival, positive administrative evaluations, acceptance of others, and feelings of adequacy. The literature review briefly touched upon initial stages of teaching and those concerns; however, specific concerns in regard to technology were also identified.

Overall Results

The study was designed as a descriptive study investigating first-year teachers' concerns regarding technology use. There were several overarching themes that were gleaned from the triangulation of the SoCQ, individual interviews, and researcher's field notes. Through the use of the SoCQ manual to understand how to read and interpret group and individual concerns, individual interviews for greater insight, and teacher-created resources for further evidence of their classroom practice, various themes were coded and extracted within a matrix. While several themes were addressed in the literature review, many themes, both extrinsically and intrinsically based were discovered a priori. These were perceived barriers to technology, teaching and learning, and teacher concerns (Appendix C).

Barriers to Technology

One of the overarching themes drawn from the SoCQ open-ended responses, as well as from course materials and the individual interviews, explored the idea that teachers are dealing with and concerned about various barriers to technology use in the classroom. Ertmer (1999) classified these barriers into two primary categories: extrinsic, or external, and intrinsic, or internal, factors. Extrinsic, or external, barriers include "lack of resources, adequate training, technical support, and time; intrinsic barriers include teacher beliefs, visions of technology integration, and views about teaching, learning, and knowledge" (Ertmer, et al., 2006).

Several open-ended responses from the SoCQ focused on external and internal factors such as years of experience, self-rating themselves as technology users, additional technology usage while student teaching or within the first year of teaching, and possible technology initiatives to implement within their schools. When open-ended responses were coded, based on key words or themes from the existing literature review and posthoc information gathered from the interviews and classroom materials, various themes were evident concerning barriers to technology. Three broad themes extracted from the triangulation were: (a) access to technological equipment, (b) teaching and learning, and (c) concerns with technology (Appendix C).

Access to Technological Equipment

Access to equipment was a theme carried over from the literature review and the basic findings within general terms in education. Teachers often find themselves at a wall or barrier when it comes to needing technology in their classroom, but extrinsic issues, such as budget and time, become an issue. Although there are usually technologies available for use, teachers are

limited by their own knowledge of how to implement it in the classroom or having enough time in their day to explore options within their school for implementation.

Funding for technology within the classroom is a major concern for teachers that is evident throughout the literature and the mainstream media. When budgets are cut within school districts, many things suffer, including the purchase of new technologies. Course materials helped to understand what technologies the teachers utilize currently and how they are being implemented. In addition, individual interviews assisted in understanding various technologies teachers would like to use or are investigating. Kelly stated that "I would really like to have an ELMO available; however, with budget cuts and what not, that doesn't seem possible." Kelly does not currently use a great deal of technology, but feels that implementing more technology would be a monetary issue. "It would be nice if we had a few more things [technical devices] to use in the classroom, but I'm thinking that it comes down to budget." Budgetary issues are frustrating to teachers and other stakeholders and are an undeniable barrier, regardless of how the teacher implements the technology, whether administratively or for student learning.

Jean, who said her administrator encourages the use of technology within the classroom, does not state budget as a concern, either because she is not knowledgeable about cost or simply does not care about technology and its use in the classroom. The SoCQ data do point to the possibility that she is moving to a more Self-related stage of concern, suggesting she does not have the time to implement technology other than for basic or day-to-day applications. As Jean said, "By the time you get going and then add in technology, half the kids need help or don't understand, so sometimes it's easier to eliminate the technology from the plan." When asked about the biggest

barrier regarding her teaching, she said it was, undoubtedly, time. "It seems there is never enough time to plan a lesson and include all the essentials that you need, plus add in technology."

Time is a significant barrier stated by all of those interviewed due to various extrinsic factors, such as having the time to investigate new technologies and, once knowing what would be best within the classroom, having the time to learn the specific technology and then integrate it into the course work.

Kelly reported, "It is frustrating that we don't have the funds to have the technology we need…or really the time to explore what is out there and what might be best in my classroom." Another time-management issue includes finding time to fit technology into an already busy day and a sometimes chaotic classroom. "It [technology use] can be a lot when you are trying to just get the regular day-to-day items completed in time for tests or to keep up with the other class [team teaching]."

Although extrinsic or external factors are important regarding technology barriers, intrinsic factors are more influential regarding integration use decisions (Ertmer, 1999).

In one open-ended survey question, most teachers described the most influential factor influencing their teaching as their strong commitment to help students learn. This result is similarly described by Ertmer et al. (1999; 2001) and others (Dexter, Anderson, & Becker, 1999). While beginning technology users may base initial technology decisions on their own goals and needs (Self-related Stages of Concern) as noted by Zhao and Frank (2003), more experienced users appear to focus more on their students' needs, especially when making classroom implementation decisions (DuFour, 2000). Teachers need to grow and move into Impact Stages of Concern (5, 6), which are more student centered and less teacher centered. Dufour (2000) urged that, as teachers'

progress from first-year teachers or newer users of technology to more accomplished users, it may be beneficial to provide opportunities for them to observe the direct impacts on student learning that are obtained by more accomplished users of technology.

Teaching and Learning

Individual teaching practices were also investigated with regard to teachers and technology use. A teacher's viewpoint regarding education can provide a great deal of insight into who they are as teachers and what they value. All three teachers who engaged in the interview had an idealistic view of teaching. Words such as life-long learner, student centered, worldly thinkers, and differentiated learners were used to describe their individual teaching philosophies. Although they stated that these values are important with regard to their teachings, it is difficult to directly measure these statements and understand how their teaching philosophies or individual viewpoints directly relate to their concerns. However, it did provide insight for the researcher into how the teacher potentially views education and its value.

Many researchers and theorists have noted developmental changes in teachers (Berliner, 1988; Fuller, 1969; Fuller & Brown, 1975; Katz, 1972). Their theories focused on distinct points in development that are not related to a particular age, but are more focused on teachers' ways of thinking. Initial stages of development regarding teachers are focused on self and feelings of adequacy and acceptance. These primary stages are an outcropping of what they know teachers are, with regard to the profession and teacher education courses, but with very little teaching experience to shape their ideals about themselves, the students, and the classroom. Terminology used by the first-year teachers who were interviewed portrayed the buzz words or terminology taught to them, but most likely not experienced as a teacher.

Teacher centeredness emerged as a central factor within this research. The group, as well as the three individuals from the open-ended interviews, expressed concerns that were rated at a Self-related level. It was perceived that they egocentric in their thinking and were more concerned about themselves as teachers, than about the students' learning and other factors beyond that of a first-year teacher. They stated being "overwhelmed by just the basics" and "wishing I had more time," yet rarely focused on the students and their needs except when asked about their teaching philosophy. As teachers move through various stages of concern and become more Impact-related, those teaching ideas and actual teaching practices will become more congruent (Argyris and Schon, 1978).

Curriculum Constraints

A variety of constraints are placed upon the curriculum when it comes to the use of technology. Teachers would like to engage students with learning that involves technology, but they have few ideas about where to start and what to do, or they do not know if the school can afford or has that technology for use. Many teachers lack the resources, understanding, or knowledge regarding technology integration within their classroom, let alone integration into the curriculum for higher-level learning. Teachers gaining knowledge about technology use is one of the more complicated issues with regard to teaching and learning. To some, computers are a side note or obsolete within in the teaching process (Cuban, 1986), whereas some see it as a vital part of teaching if implemented in the correct way (Law, 2008). In general, preservice teachers need to have a better understanding of how to use technology to facilitate learning that utilizes technology (Angeli & Valanides, 2009). While today's students may be fairly knowledgeable about a variety tools, they have little knowledge about how to use these tools in an effective instructional manner.

This was evident by statement made by Kelly when asked about teacher preparation and technology:

I wish there were more opportunities available. In college I was required to take a tech course, but all it consisted of was making and presenting a PowerPoint. . .not real advanced! It would have been nice to have exposure to more technology and technology integration, but there just wasn't.

Furthermore, novice teachers need to know how to use technology to facilitate student-centered instruction. "Teacher learning should prepare teachers not only for *any* kind of ICT integration, but should equip teachers for '*best practices*' in ICT integration that contribute to improving existing teaching practice to achieve the goals of school reform" (Law, 2008).

It is evident that there is a greater need for more instruction at the preservice level and within the student teaching experience. Eighty-nine percent of the participants (n=22) who answered an open-ended question on the SoCQ regarding their teacher preparation and technology, cited that there was very little that was centered around application within their subject area; that was more about how to use technology, and that was really focused on increasing student learning with its use. Jean's impression of a preservice technology course was,

really not a lot [of technology], just one class and it was more about each computer program and how to use it, but not so much about using it within our subject matter or classrooms. You know, like specific types of software or programs that could be used in elementary schools.

Prepping Teachers for Tomorrow

Teacher education has been cited numerous times with regard to its lack of technology-based instruction or the essentials needed to integrate technology into the curriculum

(Strudler & Wetzel, 1999). Many times, it is an afterthought or simply not implemented due to the instructors' lack of knowledge or comfort level (Cuban, 1999). CaleyKelly said that "take one tech course that consisted of making one PowerPoint and presenting it…not real advanced." Although most Schools of Education offer one course on learning and implementing technology into their teaching, very few instructors or cooperating teachers are using technology on a daily basis.

Participants from the study (n=22) cited very little, if any, preservice technology education or in-service education. They stated that they had "one course" or that course would be categorized as a computer course, not really a course how to use technology within teaching. Those interviewed were t "willing to use it" but needed the time and the knowledge to explore what was available and applicable to their teaching area. One conclusion to be drawn from this finding would be university-wide technology courses encompassing not only the use of technology but also integration into the curriculum. When the professor conveys technology's value and importance, then the student might adopt the same mentality.

Concerns with Technology

Various concerns were initially cited in the finding from the SoCQ, as well as in the open-ended portion of the questionnaire. Those questions touched upon technology use, training, self-rating technology expertise, and school-based technological initiatives. After analyzing the aggregate from the SoCQ, the greatest concerns or the highest peaks were with Awareness (81%) and Informational (80%) concerns. Interviews, primary documents, or course materials helped triangulate or verify the data regarding teachers currently being at nonuse or self-related levels. Either they do not use technology a great deal and/or they are more concerned with themselves as

first-year teachers than with those issues relating to student learning, collaboration with peers, expanding the use of technology, or the actual innovation. Although most teachers did have a slight up tail toward the Collaboration Stage of Concern, noting that they were willing to work with others and "I would like to know more about some of the things [technologies] we have at our school and see what other teachers are doing" as stated by Kelly.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

This study examined first-year teachers and concerns they held with regard to technology use in the classroom. This topic is important because a review of the literature revealed that the expectation for the use of technology within schools is increasing, yet many new teachers are not prepared to integrate the technology into the classroom. The literature review supported the use of a concerns-based model to address individually the teachers' perceived concerns regarding a specific innovation. In this case, technology use in the classroom was the focus, and this enabled addressing the various concerns teachers held and developing a more in-depth perspective with the use of personal interviews. The results of the study indicated that, based on this sample, first-year teachers are expressing the initial stages of development, as indicated by Fuller (1969). Teachers ranged from a level of non-concern to a level of emerging concerns about self and possibly striving to acquire specific technology knowledge. Equally as powerful are the key themes that emerged from triangulation of the data, such as access, time, resources, technology knowledge, individual support, and school budgets for technology.

The purpose of this study was to investigate first- year teachers' concerns regarding technology use. A review of current literature on teacher development identified the first year of teaching as particularly problematic as teachers enter initial stages of development. One theory of development is based on Fuller's (1969) stages of concerns. In this study, a concerns-based model that measured concerns of first-year teachers and their use of technology was utilized. Two research questions framed this study:

1. What are first year teacher's concerns toward the use of technology in their classrooms to achieve higher-level learning as shown by their score on the Stages of Concern Questionnaire (SoCQ)?

2. What do first-year teachers express as their concerns with technology use?

The analysis of data outlined in Chapter Four expressed various key internal and external factors that are significant concerns for first-year teachers and technology use in the classroom. In this chapter, final overall conclusions and their implications are offered. Recognition of the limitations of the study and a discussion of suggested future research are also presented.

Various education professionals see technology as a necessary tool for teachers and students in the classroom setting. However, a disconnect between what first-years teachers are expected to implement (e.g., state-based technology standards, NETS-T, etc.) and what is actually occurs in the classroom room provides an interesting context to explore. Using a concerns-based perspective, first-year teachers cited various external and internal factors were perceived to be affecting their integration of technology in the classroom.

Major Findings and Implications

The review of literature in Chapter Two encompassed research surrounding the National Education Technology Standards (NETS), about teachers and technology, as well as internal and external factors affecting teachers' use of technology. Previous research revealed that technology, although valued as an educational tool, is not central in teacher preparation courses in most colleges in the United States. In fact, government- based programs have focused more attention on in-service teachers receiving training and guidance, than on pre-service teachers (U.S. Congress, April 1995).

This study focused on first-year teachers and their use of technology, as well as factors potentially affecting technology use in the classroom. The results of this study contributed information to the view that first-year teachers have little concern about technology within the first year of teaching, but are more focused on themselves as the teacher. Although all participants cited using some form of technology within their classrooms, some participants were not concerned about its use or were simply too busy focusing on themselves and their role in the classroom. The interviews assisted in gaining additional insight into barriers to technology use in the classroom, such as time, budget, technology knowledge, and access to technology.

This study provided data about Research Question 1: "What are first-year teachers' concerns about the use of technology in their classrooms to achieve higher-level learning, as shown by their score on the SoCQ?" The results indicated that first-year teachers express concerns parallel to the concerns theory, which states that teachers go through a series of development stages. Traditionally, new teachers are focused on themselves and their performance and acceptance by peers and administration. Much like the initial stages of development, first-year teachers participating in the study had great concerns with regard to themselves and their needs as teachers, and later stages revealed the focus on student-centered education and collaboration. Based on the SoCQ, the majority of participants had high peaks or exhibited heightened concerns in the stages of "Unconcerned" or "Self." Stage 1, the "Informational" stage was the highest stage for participants, which indicated that they would like to know more about technology, but the score did not indicate how much knowledge or understanding respondents actually possess. The second highest peak, or concern, was the "Personal" stage (Stage 2), in which first-year teachers are more concerned with how technology in the classroom would affect them as a teacher.

Research Question 2 asked, "What do first-year teachers express as their concerns with technology use?" The results indicated a clear answer based on the patterns established in the SoCQ data when coupled with the interviews. These possible stage progression were further validated by personal interviews conducted by the researcher in which first-year teachers cited not having enough time, limited budget, lack of education or knowledge, or lack of access to technology. Various internal and external factors were cited by first-year teachers within the interview process. The interviews helped the researcher understand and identify actual issues regarding first-year teachers and technology.

While not definitive, the study provided an answer to Research Question 1. The results showed that first-year teachers were more concerned about themselves as teachers and less concerned about how technology affected student learning or possible collaboration with others. In line with various theories on teacher development, teachers are in a fight-or-flight mentality and have little time to concentrate on anything but themselves and, potentially, their teaching.

Initial response to a stressful situation by new teachers can often result in a fight-or-flight response. Originally, Canon (1929) discovered, there are specific reactions to stress in which the human body and nervous system evolved to cope with immediate threats to their well-being and safety. These threats elicit strong emotions and prepare the body (e.g., increase in blood pressure, release of sugar for use by muscles) for a vigorous and immediate behavioral response to the threat or stress–that is, either fighting or fleeing. Defined in general terms, stress is an unpleasant emotional state (Miller & Fraser, 2000). In terms of education, teacher stress is commonly defined as a series of negative emotions resulting from the teacher's job (Kyriacou, 2001). As new teachers enter the classroom, they are faced with multiple stressors that potentially engage a

fight-or-flight response. This innate response emerges and forces teachers to maintain stability within their environment to cope and essentially swim or sink within the classroom environment.

Recommendations for Further Research

Further research on first-year teachers and their concerns regarding technology use would be valuable due to the increase in technology availability in general, and the increasing emphasis on technology standards for teachers. Routinely cited within the previous literature, as well as in this study, are issues of access, resources (time and budget), and support as external issues, as well as teachers' attitudes and beliefs as internal issues (Hew & Bush, 2007). Issues regarding technology use in the past have consistently centered on access to computer resources, support for technology, preparation to teach with technology, and little integration of technology during student teaching (Studler, 2001). As stated by Ertmer & Leftwich (2009), although technology readiness and use is increasing due to greater technology in the classroom and technology standards, very little applications are for higher-order thought processes. Over half of the first-year teachers in the study repeatedly expressed they were more concerned with themselves as teachers, and/or were willing to implement technology in the classroom, but faced various obstacles in doing so. Over 79% of 1,000 teachers self-reported in a "Teachers Talk Tech" (CDW-G) survey and revealed that they use computers "to teach students," yet most data still points out that integration is the real issue (Mueller, et. al., 2008).

Further research to shed more light on the foundational technology and pedagogical needs of preservice teachers is needed. Most important, both the effective implementation of technology within preservice education and a greater expansion of technology integration within postsecondary institutions are needed. Although this would require change on the part of

administration and faculty, it could realistically promote technology integration into the curriculum, and not simply using the technology as a low-level administrative tool (e.g., grades, programs, attendances records, etc.). In order to implement successful programs within schools, stakeholders need to understand teacher's individual concerns, and provide training that may have been be lacking in teachers' previous experiences in the classroom. The question should not be focused on the when and where, but should be more focused on how integration can become an outcome within education. Technology is a mainstay within education and is consistently valued through implementation of technology standards, the increase in technology in schools, and external expectations of administration, parents, and various stakeholders. Because teachers have technology readily available, does not mean they will necessarily implement it into the curriculum. The problem to be considered is how teachers can be assisted regarding the integration of technology.

Recommendations for Practice

Technology Support

Teachers need various support mechanisms throughout the adoption process if they are going to implement a new innovation fully. It is more than likely that each teacher will need various interventions or support tactics to implement the innovation fully. In this case, that means technology use in the classroom. Administrators, trainers, and other stakeholders hoping to impact student learning positively through the use of instructional technology need to provide a clear demonstration of how the use of instructional technology tools can address the personal concerns of teachers. Use of a concerns-based training model, rather than a skills-based training model, is one method to address concerns and feelings that may be inhibiting teacher use of technology.

Several studies have concluded that appropriate training, sufficient time, and attention to teacher concerns result in a shift from lower self-concerns to higher intense task and impact concerns (Atkins & Vasu, 2000; Casey & Rakes, (2002); Goldsmith, 1997; Hope, 1997; Vaughan, 1997). This finding also potentially supports the developmental theory of Fuller (2000), who found that, in a school, technology support for teachers is more critical to student use than direct student support. Fuller found that teachers who receive sufficient, personal support for the use of technology tend to have students who both use technology more and use it more effectively.

Understanding Technology Use

Results found in the literature review also indicated a strong need for more information about how teachers are actually using technology. Although the idea that teachers are using technology more for low-level applications (grade programs, administrative tools, and student typing) is evident, there are very little data to point out the exact technologies that are being utilized and in what way. Knowing that, computers may be used in a classroom every day, does not, in fact, tell us how they are it is being used within the learning process. Are students using the computers to play games, or are they developing projects using higher-order thinking skills? Students, in most cases, are not being taught to integrate technology for higher-level thought processes (Etmer & Ottenbreit-Leftwich, 2009). In order to implement greater integration by teachers, changes must take place that include teacher concerns; content knowledge; pedagogical knowledge; and altered instructional resources, technology, and materials (Fullan & Stiegelbauer, 1991).

In general, teachers are traditionally a very conservative group and are resistive and slow to adopt change and innovations (Ponticell, 2003). Although teachers may feel that the use of

technology is a positive addition to their teaching repertoire, they are resistive to integration due to a lack of knowledge (Lawless & Pellegrino, 2007), low self-efficacy (Mueller, et al., 2008), and existing belief systems (Ertmer, 2005). Furthermore, the teaching context and culture can limit the individual growth or efforts of teachers (Jacobs, Clifford & Friesen, 2002; Willis, 2005).

From the perspective of a concerns-based theory, institutionalization of an innovation (technology use) only occurs when the majority of the individuals within the school have resolved or lowered their concerns found in within Stages 1, 2 and 3. In order for an innovation to become functional within the school, the high intensity of concerns associated within the Informational, Personal, and Management stages must also be resolved (Hall, George, & Rutherford, 1978). "If these early concerns remain intense, then the user is apt to modify the innovation or their use of the innovation, or perhaps discontinue use, in order to reduce the intensity of these concerns" (Hall et al., p. 13). The results of this study indicated that the institutionalization of technology use in the individual teacher's classrooms has yet to occur, as they were still within Stages 1, 2, and 3. Most important, administrators and trainers seeking to make technology an integral part of teaching and learning need to provide a clear demonstration of how the use of instructional technology tools can address the personal concerns of teachers.

Technology Knowledge

Knowledge of how to teach with technology needs to be the focus of school districts in order to tackle issues of technology integration. According to Shulman (1986), teacher knowledge includes knowledge of the subject (content knowledge), knowledge of teaching methods and classroom management strategies (pedagogical knowledge), and knowledge of how to teach specific content to specific learners in specific contexts (pedagogical content knowledge). In order

to use technology effectively in the classroom, teachers need additional knowledge and skills that build on, and intersect with, those that Shulman (1986) described. This knowledge acquisition has been conceptualized in a variety of ways, including technological pedagogical content knowledge (AACTE, 2008). This, as well as other models, is founded upon the idea that effective technology integration must be centered on technology, content, and pedagogy. Technology integration requires both preservice and in-service teachers to gain knowledge about the actual technology tool(s) and how each tool can be used to promote the learning process (Angeli & Valanides, 2009).

For teachers to begin to integrate technology effectively into the classroom, they must first gain knowledge regarding technology itself. Based on the NET-T Standards (2008), teachers are to possess some basic skills and knowledge after leaving their postsecondary institution. In most cases, graduating teachers are more likely "digital natives," due to more self-taught acquisition of technology than that learned within a pre-service education course. In-service teachers are more likely to gain knowledge from outside sources, such as in-service workshops or peer collaboration (CDW-G, 2006). The fact that teachers have computers on their desks and various technologies within the school or district, does not imply that they know how to implement them effectively. For teachers to integrate technology, they will have to alter or learn new pedagogical practices including planning, implementation, and evaluation. This requires teachers to choose the best technology tool (hardware and/or software) for the task, then teach the student how to use the tool, meet the needs of the students and the curriculum, and manage the technology (hardware and/or software) (Coppola, 2004).

A student-centered form of instruction is important to the process of integration, which, for first-year teachers, is a difficult task due to their own process of development as a professional.

Most first-year teachers can only master the immediate tasks at hand and are not cognizant about student learning or higher-level learning strategies. The SoCQ data revealed that the participants were like most novice teachers; only concerned about themselves and potentially willing to learn and try new things. However, for first-year teachers to focus on a student-centered approach, they must move outside themselves and implement a plan that engages them as the facilitator and students as the explorers. If, as research and the CBAM theory stated, teachers will generally move from stage to stage, from acquiring self-efficacy skills that support moving through self-related concern to, eventually, those concerns encompassing student learning. Because moving through various teaching stages and holding different concerns is such an individual-based component of teaching, not all knowledge acquisition of technology and pedagogical knowledge will be adhered to within a specific time frame or the same progression.

The possession of knowledge about technology and what tools (hardware and/or software) are available, does not translate into immediate implementation in the classroom. Concerns that teachers have regarding technology are very confounded and are highly individual. The knowledge of something does not immediately translate into student learning, especially with first-year teachers and their more egocentric viewpoint about teaching. Piper (2003) reported a significant influence of self-efficacy on novice teachers' classroom uses of technology based on her survey of 160 elementary and secondary teachers. Skills related to self- efficacy have been found to be one of the most important factors in successful technology integration. Wozney, Venkatesh, and Abrami (2006) studied over 750 teachers and found that one of the two most common predictors of teachers' technology use was their confidence that they could achieve instructional goals using technology. This suggested that time and effort should be devoted to

increasing first-year teachers' confidence in technology use, not just to accomplish administrative and communicative tasks, but to integrate it into the curriculum for higher-level, student-based learning. Confidence can be gained through experiences that promote teacher success.

Various ways can be implemented to promote teacher success with technology in regard to confidence building. For example, in most instances of dealing with teachers and students, each approach is different and highly individual, and the teacher may need various methods to feel successful and confident regarding implementation. However, adopting a notion of playing and exploring technology (Somekh, 2008); modeling or mentoring; promoting small, successful experiences (Ottenbriet-Leftwich, 2007); working with knowledgeable peers (Ertmer, 2005); and participating in professional learning communities (Putnam & Barko, 2000) are some notable approaches to helping teachers gain the confidence they might need to succeed with technology in the classroom.

Time for Technology

Although many factors affect first-year teachers, time is a central issue described by most novice teachers in this study (Bauer & Kenton, 2005). Regardless of technology integration, time not only is often cited as one of the major factors contributing to teachers' stress levels in the classroom but also contributes to the lack of technology use in the classroom. As first-year teachers are forced to juggle the newness of their environment, and the daily demands of teaching, they find very little time for technology exploration. Generally, first-year teachers only use technology for administrative purposes and communication tasks and not to engage students with technology use for more than just home assignments or practice and drill (Palak & Walls, 2009;

Project Tomorrow, 2008). First-year teachers need time to explore, play, and understand the benefits of technology to foster more student-centered learning.

Access to Technology

Computers, the Internet, and education software is available in over 74.1% of the classrooms in the United States, yet very few teachers find themselves implementing it or using it for tasks other than basic applications (National Education Association, 2008). The majority of teachers cite lack of training regarding implementation of technology in their classroom as the reason for their deficiency (Drexler, Baralt & Dawson, 2008). Various schools in the United States have either technology that teachers can access or the resources available, but lack the knowledge to integrate the technology within the curriculum in order to achieve higher-order, student-centered learning is lacking. Various external factors can contribute to the barriers to technology use in the classroom. Based upon 48 empirical studies, Hew and Bush (2007) stated that the majority of the barriers to implementation are repeatedly cited as (a) resources, (b) teacher knowledge and skills, and (c) teachers' attitudes and beliefs.

Conclusion

Teachers' concern with technology is an ongoing issue that, most likely, will not disappear as technology, as a tool, continues to change and grow and as technology standards become pertinent in an age of digital learning and citizenship. Novice teachers, as shown by the SoCQ and coupled with Fuller's stages of concern, are most likely to have concerns about technology that are more self-related. In-depth interviews helped to understand and shed light on more individual concerns and provided a deeper insight into what key issues involve technology use in the classroom. As first-year teachers grow and adapt to their profession, in lieu of just "making it

through the day" they are more likely to engage students in higher-level learning. Understanding by teachers themselves, as well as by administration and stakeholders, that first-year teachers need to be encased in an environment that promotes extra time for technology awareness or knowledge, building of self-confidence, and time to explore their own beliefs and concerns regarding teaching is necessary.

Secondarily, the integration of technology is not a topic that is easily avoidable or something that can be swept under the rug with regard to teachers and education. Stakeholders, who encompass parents, students, administration, tax payers, and political officials, expect technology to be integrated into learning and for students to possess the knowledge of how to use it and when to apply it (NETP, 2010). We are in an age where it is unavoidable and must continue to be at the forefront of discussions regarding teachers, administration, teacher mentors, and teacher educators. Teachers are also experiencing the push not only for greater technology skills, but also for the use of innovation and advanced applications regarding technology that both encourage the student to utilize higher-order thinking skills, teach the importance of digital citizenship, and a 21st Century learning (ISTE, 2009).

As a result, the value of education depends on the standards, stakeholders, and the willingness of teachers to integrate technology into their curriculum, and teachers are expected to enter their field of teaching with a great deal of knowledge and skill. The purpose of this study, therefore, was to investigate concerns that first-year teachers held with regard to using technology in the classroom. The results of the study revealed that first-year teachers are developing as educators and, because they are primarily focused on self, have little time to devote to the outside components of teaching. Therefore, their concerns are related to a more self-related level and have

very little focus on the students and their needs. The results of the study also indicated that there are major internal and external factors that contribute to the nonuse, or lack, of technology in the classroom. Reasons for this most often cited were issues regarding time, access, technological knowledge, and technology support.

The results from this research did not begin to answer all the questions related to first-year teachers and their technology use within the classroom. Many questions still remain, as indicated by the review of the literature and current findings. However, this study adds to the body of literature that preceded it and assists in the understanding of first-year teachers' concerns about using technology. This research helps to explain better or present findings based on first-year teachers' development and the perceived concerns they held regarding technology, in addition to their concerns regarding various internal and external factors. Examples of these factors pointed to teacher-based internal and external needs, such as time, access, teacher knowledge, teacher support, and understanding of technology in general. The study also helped to indicated that first-year teachers do go through stages of development, and quite possibly those stages concerning technology use and integration have no effect on the teachers' position within the developmental stages. With regard to these findings, first-year teachers are mainly concerned about self-related topics when discussing technology in the classroom.

The researcher's recommendations are to identify programs, through qualitative research components, followed by quantitative research components that assist in the acquisition of technology in the classroom for successful integration. Investigation of current research and implementation of newer models of classroom teaching concerning the integration of technology, as well as accounting for the current Kansas standards, is one approach to developing a process for

integration. Pragmatic application of technology that meets the current needs of the curriculum, as well as the needs of novice teachers, could help these teachers overcome the barriers to technology integration that they face on a daily basis. Most important is understanding and addressing individual teacher concerns and how those concerns can be alleviated on a one-to-one basis to ensure the success of various technology initiatives within the district. The use of real-world applications from the teacher's world, accompanied by current research, would help to ensure the best of both worlds.

From a research perspective, it would be helpful if the participants in this study could be re-examined each year, as they transition through the various stages of development as a teacher, to record not only any evidence of change, but also their concerns regarding technology in the classroom. A follow-up interview with the three teachers who were part of the in-depth questioning would also be helpful. As the subjects grow, change, and gain great experience in the classroom, it is predicted that their opinions might change or be affected in some way. The most important factor or outcome that generated from this study is the teachers' ability to integrate technology into their curriculum not only to assist in student learning and make them knowledgeable concerning technology, but also to help them understand the power that technology possesses for their future. Student learning with regard to technology in the classroom, coupled with understanding teachers' concerns about technology, needs to be the goal of those who are proponents of technology in education.

This study was helpful in describing what a set of first-year teachers were concerned about when using technology in their classroom. However, in no way did it explain a causal relationship between teacher concerns and technology use. What was sought in this study was to shed light on

how a group of teachers viewed technology use within their classroom, as well as possible ways to assist them in the process of integration for a more student-centered classroom.

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http://www.kansas.com/2013/01/12/2632578/court-kansas-funding-for-schools.html#storylink=cpy

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APPENDICES

APPENDIX A: Additional Tables, Charts and Individual Interview Questions

Table A1. Original Stages of Concern Questionnaire Grouped by Stages

Statements on the Stages of Concern Questionnaire Grouped by Stage	
Stage 0 - Awareness	
Item #	Statement
3	I don't even know what is.
12	I am not concerned about using technology at school.
21	I am completely occupied with other things other than technology or technology use in the classroom.
23	Although I don't know about using technology in the classroom, I am concerned about things in the area.
30	At this time, I am not interested in learning about using technology in the classroom.
Stage 1 - Informational	
6	I have a very limited knowledge about using technology in the classroom.
14	I would like to discuss the possibility of using the technology in my classroom.
15	I would like to know what resources are available if I decide to adopt technologies in the classroom.
26	I would like to know what the integration of technology will require in the

immediate future.

35 I would like to know how the use of technology in the classroom is better than what we have now.

Stage 2 - Personal

7 I would like to know the effect of technology use in my classroom will affect my professional status.

13 I would like to know who will make the decisions in the choosing technologies for the classroom.

17 I would like to know how my teaching or administration is supposed to change due to the use of technology.

28 I would like to have more information on time and energy commitments required by using technology in the classroom.

33 I would like to know how my role will change when I am using technology in the classroom.

Stage 3 - Management

4 I am concerned about not having enough time to organize myself each day.

8 I am concerned about conflict between my interests and my responsibilities.

16 I am concerned about my inability to manage all the requirements of using technology in the classroom.

25 I am concerned about time spent working with nonacademic problems related to using technology in the classroom.

34	Coordination of tasks and people is taking too much of my time to use technology in the classroom.

Stage 4 - Consequence

1	I am concerned about students' attitudes toward technology in the classroom.
11	I am concerned about how technology in the classroom affects students.
19	I am concerned about evaluating my impact on students.
24	I would like to excite my students about their part in using technology in the classroom.
32	I would like to use feedback from students to change the use of technology in the classroom.

Stage 5 - Collaboration

5	I would like to help other faculty in their use of the technology in the classroom.
10	I would like to develop working relationships with both our faculty and outside faculty using technology in the classroom.
18	I would like to familiarize other departments or persons with the use of technology in the classroom.
27	I would like to coordinate my effort with others to maximize technology's effects in the classroom.
29	I would like to know what other faculty are doing with technology in their

	classroom
Stage 6 - Refocusing	
2	I now know of some other approaches (technology) that might work better.
9	I am concerned about revising my use of technology in the classroom.
20	I would like to revise the instructional approach regarding technology in the classroom.
22	I would like to modify our use of technology in the classroom based on the experiences of our students.
31	I would like to determine how to supplement, enhance, or replace technology in the classroom.

Adapted from George, A. A., Hall, G. E., & Stiegelbauer, S. M. (2006). *Measuring implementation in schools: The stages of concern questionnaire* (2nd ed.). Austin, TX: Southwest Educational Development Laboratory.

APPENDIX B: Participant Data

Table B1: Aggregate Data

Table B1-a: Group Question/Responses Table

Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Q3: **52**	Q6: **31**	Q7: **73**	Q4: **68**	Q1: **58**	Q5: **70**	Q2: **78**
Q12: **25**	Q14: **82**	Q13: **82**	Q8: **47**	Q11: **79**	Q10: **77**	Q9: **54**
Q21: **66**	Q15: **82**	Q17: **75**	Q16: **40**	Q19: **72**	Q18: **79**	Q20: **75**
Q23: **43**	Q26: **75**	Q28: **68**	Q25: **51**	Q24: **86**	Q27: **80**	Q22: **75**
Q30: **53**	Q35: **86**	Q33: **71**	Q34: **39**	Q32: **72**	Q29: **87**	Q31: **78**

Table B1-b: Group Raw Score Totals

	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Sum of raw scores:	**239**	**356**	**369**	**245**	**367**	**393**	**360**
Average:	**14**	**21**	**22**	**14**	**22**	**23**	**21**

The sum of each column from the table in 6-1. The average is the sum divided by the number of questionnaires included (17).

Table B1-c: Group Raw Score to Percentile Conversion Table

Five Item Raw Scale Score Total	Percentiles for stage:						
	0	1	2	3	4	5	6
0	0	5	5	2	1	1	1
1	1	12	12	5	1	2	2
2	2	16	14	7	1	3	3
3	4	19	17	9	2	3	5
4	7	23	21	11	2	4	6
5	14	27	25	15	3	5	9

6	22	30	28	18	3	7	11
7	31	34	31	23	4	9	14
8	40	37	35	27	5	10	17
9	48	40	39	30	5	12	20
10	55	43	41	34	7	14	22
11	61	45	45	39	8	16	26
12	69	48	48	43	9	19	30
13	75	51	52	47	11	22	34
14	81	54	55	52	13	25	38
15	87	57	57	56	16	28	42
16	91	60	59	60	19	31	47
17	94	63	63	65	21	36	52
18	96	66	67	69	24	40	57
19	97	69	70	73	27	44	60
20	98	72	72	77	30	48	65
21	99	75	76	80	33	52	69
22	99	80	78	83	38	55	73
23	99	84	80	85	43	59	77

24	99	88	83	88	48	64	81
25	99	90	85	90	54	68	84
26	99	91	87	92	59	72	87
27	99	93	89	94	63	76	90
28	99	95	91	95	66	80	92
29	99	96	92	97	71	84	94
30	99	97	94	97	76	88	96
31	99	98	95	98	82	91	97
32	99	99	96	98	86	93	98
33	99	99	96	99	90	95	99
34	99	99	97	99	92	97	99
35	99	99	99	99	96	98	99

Table B1-d: Group Percentile Scores

Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
81%	**75%**	**78%**	**52%**	**38%**	**59%**	**69%**

Computed by referencing the raw score for each stage in the table 6-3.

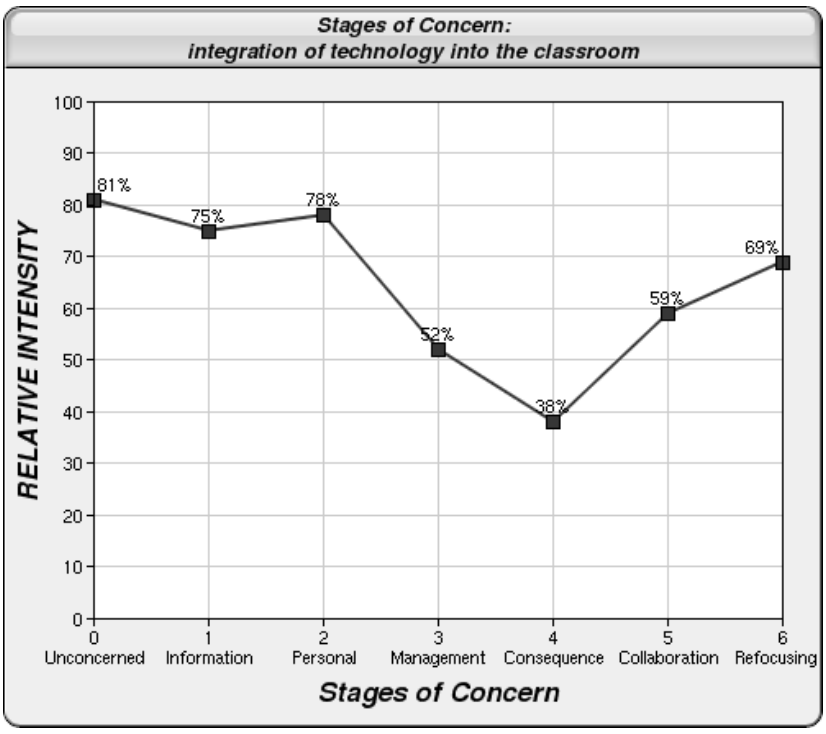

Figure B1. Group Stages of Concern:

Appendix C: Individual Interview Questions

How long have you been teaching?

What grade level do you teach? What subject?

What is your educational background?

Is teaching your first career? If not, what other types of employment have you had?

When did you complete your education coursework?

What type of technology was included in your teacher preparation, if any?

What do you see as your primary role as a _____ teacher? (Follow up question as necessary.)

How would you describe your teaching philosophy?

What type of environment do you think is best for student learning?

Describe a typical day in your classroom. What are you doing? What are the students doing?

In what ways do you currently use technology for administrative purposes?

Do you view the inclusion of technology as essential or an elective component in student education? Please explain.

How do you envision technology integration? Is this vision a reality? Please explain.

With regards to technology in the classroom, what do you feel most confident doing? What do you feel least confident? Has your confidence levels influenced your technology integration? How?

What barriers do you encounter when trying to integrate technology?

Probing questions related to: materials, management, support, and skill

How has high-stakes testing affected your technology integration?

When you hear the term higher-order thinking, what do you envision?

How do higher-order thinking and technology relate to one another?

How do you include technology in your _____ class?

Follow up questions related to: materials, management, planning and projects

Describe your plans for the year – re: technology and higher-order thinking.

Adapted from Franklin, C. F., & Molebash, P. E. (2007). Technology in the elementary social studies classroom: Teacher preparation does matter. *Theory & Research in Social Education, 35*(2), 153-195.

Appendix D: Participants Responses to Personal Interview Questions

Participant #7 – Amanda December 2011

How long have you been teaching?

Only one year of teaching experience, only since August.

What grade level do you teach? What subject?

High school math, Algebra I and Integrated Algebra

What is your educational background?

I obtained bachelors in education from Tabor College in May 2011.

Is teaching your first career? If not, what other types of employment have you had?

This is my first career except for part-time jobs during HS and college. Those jobs didn't involve teaching, but my mom was a teacher and that's the reason I wanted to teach. …I used to help her in her classroom when I was young. Coach is the closest thing to teaching that I have done in the past.

*Where any of them technology related or educationally related – babysitting, no computer use per say

When did you complete your education coursework?

May 2011

What type of technology was included in your teacher preparation, if any?

Very little, much was *not demonstrated for use in the classroom*, I guess it was *not expected or shown as an example of how to use with teaching/subject matter*. I think sometime they didn't know how to use it themselves, so it wasn't used in most cases?

What do you see as your primary role as a HS Math teacher? (Follow up question as necessary.)

My primary role, I think, is to help kids learn the basics of Algebra and math and maybe even find a way to love it? I think that some of the kids I get (intermediate Algebra) already hate the subject, so I try to make it fun.

How would you describe your teaching philosophy?

I love being with kids whether it's in the classroom or on the field. There is always something to learn that can help later in life. If I can teach just one kid that math is important and valuable later in life, then I think I've done my job.

What type of environment do you think is best for student learning?

I think a good learning environment is one where…the kids have time to think about the problem from a *real world perspective* and not always stressing about passing a test or finishing a problem. I think the process is just an important…in fact I give credit for the right process.

Describe a typical day in your classroom. What are you doing? What are the students doing?

Student come in and we review yesterday's work with questions or problems that were either emailed or suggested by the class for follow up or just reworking it. We then move on to the board and our agenda for the day. That can include board work, *clickers* with terms or fun math aps, group work or instruction.

In what ways do you currently use technology for administrative purposes?

I use our grading program called Skyward to input all my grades. I also use my home computer to grade at home, although a lot of what we do can be done with computers now…as the grader.

Do you view the inclusion of technology as essential or an elective component in student education? Please explain.

I think *using technology is important in the classroom*, but there is a time and a place for it in mathematics. So much of what we do is what you would call the basics and it seems like we are stuck with paper and pencil. I know there are other ways to introduce material or go over problems, *it's just easier sometimes*…or maybe we *don't have that device or technology to do it.*

How do you envision technology integration? Is this vision a reality? Please explain.

In the future, I would *like to use more technology,* but in the higher level math courses. *I know that we could use iPad and other technology* for learning how to solve problems or for math aps. There are probably so many things out there to use, but it's *also having the time to look for those things* and then decide if we can do them.

With regards to technology in the classroom, what do you feel most confident doing? What do you feel least confident? Has your confidence levels influenced your technology integration? How?

The technology I use mainly in my class is Smart board, clickers, Skyward (online grading), laptop. I feel confident with those pieces of equipment because they are easy for students and teachers to use. *It would be nice if we had a few more things to use in the classroom*, but I'm thinking that *it come down to budget*.

What barriers do you encounter when trying to integrate technology?

I think most of the time, barriers to using technology would be *actually using it and having the time to figure out what to use,* if we have it in the school or can get it then using with umm, (interrupted) with your kids and not taking lots of class time figure it out. But kids know so much about technology that it doesn't take long for them to catch on… I would use it if I knew it would make the things faster or that kids would learn as much – for testing the clickers work well and are easy to use.

Probing questions related to: materials, management, support, and skill

How has high-stakes testing affected your technology integration?

I *don't think that testing has affected the use of technology within my classroom*…If anything it has helped because *we use it to prepare for testing* and use the clickers as a fun way to learn or test also. Most testing is on the computers now anyway.

When you hear the term higher-order thinking, what do you envision?

In math, I think of higher order thinking word problems and open ended problems where students have to *think outside the box*. Is that what you wanted? (Yes) *I know it is also asking students to apply their thoughts or learning to a higher level* – like acting out, doing something creative…I think.

How do higher-order thinking and technology relate to one another?

In math it is hard to think about it, I guess we already do it, but not with technology and we could do it with technology if I had more information or classes about using technology in my classroom. I am willing to do it and try new things.

How do you include technology in your HS Math class?

Smart board, clickers, Skyward (online grading), laptop

Follow up questions/actual materials related to: management, planning and projects

Describe your plans for the year – re: technology and higher-order thinking.

I would like to know more about some of the *things we have at our school* and *see what other teachers are doing*. I think that most of the time I feel like I am just getting started and teaching what I have to teach to get through… I am willing to try new things though.

Participant #4 – Kelly December 2011

How long have you been teaching?

1 year, or two years with student teaching

What grade level do you teach? What subject?

Middle School English or Language Arts

What is your educational background?

An Education degree from FHSU, May 2011

Is teaching your first career? If not, what other types of employment have you had?

Yeah, I had some experience with kids and teaching, but not formal teaching like in a classroom with standards, testing, etc. I've helped with Sunday school and various things like that…

When did you complete your education coursework?

May 2011, in Hays. I did my student teaching in Hays also.

What type of technology was included in your teacher preparation, if any?

I wish there were more opportunities available. In college I was required to take a tech course, but all it consisted of was making and presenting a PowerPoint. . .not real advanced! It would have been nice to have exposure to more technology and technology integration, but there just wasn't.

What do you see as your primary role as a Middle School English Teacher teacher? (Follow up question as necessary.)

I see my role as introducing the students to different literature, as well as giving helping them to become strong writers and thinkers. Some of my classes are just coming out of the 5th grade and really haven't been exposed to different authors or journal writing, etc.

*Teaching materials were viewed and show a list of literature studied at each level,

How would you describe your teaching philosophy?

To teach the child as a whole, not just about nouns, verbs, etc. The use of various literature and reflective journal writing can help them to learn those basics of English, as well as escape to a different world through books and become a more worldly thinker with the right environment. Every child can learn, it just takes a teacher to believe in them…

*Although this is not addresses within the syllabus, the teacher does express words like expect, expectations, plus and over view of English from the perspective of a holistic approach. There is a huge variety of project-based learning displayed and it's very well outlined/explained in units based around literary themes.

What type of environment do you think is best for student learning?

I think a great learning environment includes one where kids are free to express who they are and aren't afraid to answer questions. They need to feel confident that their questions aren't dumb and could lead to more understanding for themselves and other around them. I like kids to be able to *explore and be creative without boundaries*, but still organized and in control – it's middle school remember. ☺

Describe a typical day in your classroom. What are you doing? What are the students doing?

After student's come in, they are expected to fill out their agenda that's on the board, then we move into SSR on most days and then move into our agenda. There is independent work for the students, as well as interactive times depending on the assignment and what we are trying to accomplish that day in class. I use agenda to help keep the kids and myself organized.

In what ways do you currently use technology for administrative purposes?

Portable laptops, mounted projector, iMovie, PowerPoint, iTunes, KCA website (and a number of other websites as well), learn360 and atomic learning. I WISH I had an Elmo-I've used one in other teaching experiences and LOVE LOVE LOVE it!! (personally answered on questionnaire). I like the Elmo because of all the things that I can do with it, as well as presentation for my students.

Do you view the inclusion of technology as essential or an elective component in student education? Please explain.

I do think that technology is very valuable in the classroom. It really is a must as the world changes everyday and they will be expected to know it on some level. It is frustrating that we don't often have the funds to have the technology we need…or really the time to explore what is out there and what might be best in my classroom.

How do you envision technology integration? Is this vision a reality? Please explain.

I would love to use different technology, like Kindles or iPads to create iMovies, read books that *we can't afford to buy*, explore authors, um…I imagine that with *some of the newer tools the possibilities could be endless.*

With regards to technology in the classroom, what do you feel most confident doing? What do you feel least confident? Has your confidence levels influenced your technology integration? How? (She stated that she would consider herself to be an intermediate user on the SoCQ questionnaire.)

I obviously feel more confident when I am just teaching my subject and doing what I love best, *but with technology it would be those technologies that I used in college and student teaching because I've used them before..like the Elmo*. I am probably *least confident with new technologies*, but I am *willing to explore* them, as I do at home quite often. Again, I think I would have more or do more

with technology if I had more *time to investigate* and we had *more money* to spend on just one or two new things for the classroom.

What barriers do you encounter when trying to integrate technology?

As I said earlier, I would really like to have an ELMO available, however with *budget cuts* and what not, that *doesn't seem possible*. Also, as a reading teacher, the new interest in Kindles is something I wish I had *more time and resources to explore*. It will be interesting to see how ipad and Kindle changes the face of reading instruction in the years to come. I also wish I had *more time* to explore iMovie. I spend many *personal hours at home* working with technology.

Probing questions related to: materials, management, support, and skill

How has high-stakes testing affected your technology integration?

High-stakes testing hasn't really had that much of an effect on what I do with technology in the classroom. We do use technology for testing prep, but mainly it doesn't.

When you hear the term higher-order thinking, what do you envision?

Thinking at a higher level, not just memorizing something, but reading it and applying it… Not just your typical memorize and test over the material kind of classroom

How do higher-order thinking and technology relate to one another?

With things like iMovie, students use higher order thinking to take a book or a story and develop into their own book to movie type activity or something like that… with an iPad students could not only use iMovie but use other tools to create interactive poems or act out scenes from books.

How do you include technology in your Middle School English class?

Right now I use technology when my student are using their laptops and I use my overhead projector – which I am glad to have, but it is *limiting* if you want to do group projects and your only have one piece of technology. It would be *nice to have more devices*, like iPads or Kindle Fires.

Follow up questions related to: materials, management, planning and projects

Describe your plans for the year – re: technology and higher-order thinking.

I plan to continue to look up technologies at home and *see what other teachers* are doing and how they are using technology. It would be neat to *gain more technology in my classroom* if there would be more *money in my budget or maybe some type of grant*.

I do plan to use some type of movie software, like iMovie or something like that for a project like I did in my student teaching when I had access to it… I think that students would enjoy it and also learn about iMovie or whatever.

Participant #9, Jean January 2012

How long have you been teaching?

1 year

What grade level do you teach? What subject?

I teach 2nd and 3rd Grade, they loop use as teachers at ____ (name of school omitted).

What is your educational background?

I actually graduated from college about 25 years ago when I got a business degree. I had a women's dress shop for many years and just decided one day to make a career change. I went back to school and got my teaching degree and here I am. I wanted to try something new and have summers off to be with my kids.

Is teaching your first career? If not, what other types of employment have you had?

No, I was a bookkeeper and a business owner for many years here in ___ (name of town omitted).

When did you complete your education coursework?

May 2010, then I couldn't get a job, so I was a sub for one year. Then I finally got hired on here at _____ (name of school omitted).

What type of technology was included in your teacher preparation, if any?

Really not a lot, just one class and it was more about each computer program and how to use it, but not so much about using it within our subject matter or classrooms. You know, like specific types of software or programs that could be used in elementary schools. I had some basic knowledge of computer from business classes many years ago and running my own business. You remember ____? (omitted the name of the business).

Personal side conversation about long time business in ____ (name of own omitted).

Things have really changed since the first time I went to college…we used punch cards, had huge computers and computers were a luxury or add on to a class instead of just part of the class or as a way to complete work.

What do you see as your primary role as an Elementary teacher? (Follow up question as necessary.)

To help the students learn the course materials, plus get through all the necessary items each week to prepare students for the next grade, the standardized tests. *It can be a lot* when you are trying to just get the regular day-to-day items completed in time for tests or to keep up with the other class (team teaching).

How would you describe your teaching philosophy?

I try to treat each child as their own – as their own learners that have different needs and different viewpoints. That is one of the first things I learned as I subbed and then this first year of teaching. There are so many different needs and different learning and it can be difficult to meet all the needs of every student, but I sure try…

What type of environment do you think is best for student learning?

Ideally a perfect classroom would be students engaged, but still willing to explore and try new things, or see things differently. But as I have learned and seen, even the best plans don't mean you will accomplish what you've planned or what you wanted to achieve as an outcome. *Some days can be frustrating and others go better than expected…you just really never know*.

Describe a typical day in your classroom. What are you doing? What are the students doing?

Student has a routine of coming in and taking care of their agendas and daily things to get the day started. Different chores or roles. We follow an agenda based on what I put on the board and the kids are expected to copy that down and follow it each day. We divide our time between those items and specials (like gym, art) and try to get through as much as possible. **What are students doing?** Even though I expect kids to work independently at times, it is hard for some to stay on track and do the work. *Some days I feel like we move backwards!* ☺

In what ways do you currently use technology for administrative purposes?

I use an Elmo daily, my laptop to play songs during calendar time and read books to my class, we use computers daily in the computer lab doing various activities (journal writing, spelling practice, math games, etc.). I have to admit that technology in my classroom is a bit of a challenge because *I didn't grow up with all the technology and computer that younger teachers, or people have around me*. ____ (her teen daughter) is a whiz and really helps me – or tries! ☺ *It is a bit*

intimidating to me, so *I avoid it at times*. I am always willing to learn and ____ (*principal's name omitted) wants us to use it*, but it is *hard to find the time* and then know what to do with it.

Do you view the inclusion of technology as essential or an elective component in student education? Please explain.

I do think that it is important for some tasks like using an Elmo to teach the class as a whole or to help get a general point across to the class, but I don't just it to the extent that I could. Honestly, I don't know how I would manage the new technology and the kids all at once. I think it could be overwhelming and maybe take more time? I'm not sure.

How do you envision technology integration? Is this vision a reality? Please explain.

I think that using technology in my class is a reality, but just not right now. I think that even if I had the latest and greatest technology, I am not sure I'd have time to use it and accomplish what I need to in a day. Some days I might, just not right now – even though we are supposed to be using it a lot more. Does that make sense?

With regards to technology in the classroom, what do you feel most confident doing? What do you feel least confident? Has your confidence levels influenced your technology integration? How?

I feel more confident using the basics in my classroom…like the Elmo, which is like an overhead projector you know and the laptop cart (25 computers available, lab teachers comes to assist if necessary). Although it is *difficult to manage 20-22 3rd graders on laptops* when we are all trying to accomplish one goal and everyone is in different places, having problems, needs help… it's nice to have help on those day in the classroom. Your confidence level and technology – how would you rate that? I am not sure I am the most confident even I had the technology. With the student's help, I might be able to figure it out. They can be a huge help sometimes.

What barriers do you encounter when trying to integrate technology?

I think I'd have to say time? It seems *there is never enough time to plan a lesson and include all the essentials that you need, plus add in technology*. By the time you get going and then add in technology, half the kids need help or don't understand, so sometimes it's easier to eliminate the technology from the plan.

Probing questions related to: materials, management, support, and skill

How has high-stakes testing affected your technology integration?

Our school does use computers or software to prepare our kids for standardized testing and I think it is a big help when they take the text on computer also. *I don't think it has really affected technology*, but it's been a huge help for preparing.

When you hear the term higher-order thinking, what do you envision?

Oh, when I think about higher order thinking I think it means or I envision it to be those projects that take extra time to plan and prepare, but I think those are the ones my *students enjoy the most* and learn the most from, like interactive stories and developing their own creative projects. Again, it's h*ard to manage larger project without the help of a para*. ____ (name omitted) is my savor someday and parents like you who volunteer their time. You have been a lifesaver someday with reading groups (directed at the researcher).

Researcher side note: this teacher was my daughter classroom teacher and I was present in the classroom at least 1-2 times per week over a 6 month time frame to help with reading groups. Her daughter was a dancer with my daughter and I know her on a more personal level, plus I gained more perspective and insight as to her teaching style, overall impression as a first-year teacher, etc.

How do higher-order thinking and technology relate to one another?

I can see how technology could be used to accomplish higher order thinking. We do a little of that with PowerPoint, but nothing, I'm sure that way we could do it. There are so many things out there and *at times it is overwhelming*. I hope in the year to come I can see what's out there and use more in my classroom.

How do you include technology in your 3rd grade class?

We use the computer lab for a lot of different things, plus I use the *Elmo* almost daily for all kinds of things. The computer lab is nice for spelling, creating *PowerPoints* and computer class.

Follow up questions related to: materials, management, planning and projects

Describe your plans for the year – re: technology and higher-order thinking.

I would like to think, or *I'm planning* that we could use the laptop cart for a period of time to develop some neat PowerPoints. I have one on my agenda for next semester that involved exploring animals and then developing specific slides. It is nice when you loop because you can see what past teachers did in your grade level…it can be helpful the first year for sure.

Appendix E: Codes/Terms/Themes Used in Qualitative Analysis

Barriers to technology

Equipment Use:

Access to equipment – "can't afford to buy" "there's only 1 laptop cart"

Lack of equipment – "there are only so many" "can't afford to buy"

Functionality of equipment – Most didn't report broken or out of commission equipment

Age of equipment – Nothing noted about outdated equipment

Technology Use:

Teacher – Elmo, Laptop/Projector, software (PowerPoint, grading program,) etc.

Student – laptops, desktops, software (PowerPoint, iMovie, iTunes, Word), etc.

Teaching and Learning

Philosophy and Practice:

Teaching Philosophy – Primary resources that each teacher provided

Teacher –centered – "I wish I had more time" "I am overwhelmed by just the basics"

Student – centered – "I think they could benefit from more technology"

Curriculum Constraints –

Prepping Students for Tomorrow/Standardized Test – "Just trying to get through what I need to get through"

Concerns with Technology

Teacher concerns with technology – "there's just not enough time"

"already overwhelmed"

"I wish we could buy" "School's can't afford"

Teacher experience with technology – “intermediate” “no college class that integrated technology”

Teacher Professional Development – “there’s not enough time to explore what new”

“I explore at home on my computer”

“Little or no training during student teaching or college courses.”